Science
Pre.1
Term 1
2022

Unit 1

Droos Science

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Droos science

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1 Write the scientific term:

1- It's anything that has a mass and a volume (occupy space).

2- It's the amount of matter that the body contains.

3- It's the space that the body occupies.

4- It's the mass of unit volume of substance.

5- The temperature at which matter changes from a solid to liquid state.

6- The temperature at which matter changes from a liquid to gaseous state.

7- Substances allow heat to flow through.

8- Substances can't allow heat to flow through.

9- Substances allow electricity to flow through.

10- Substances can't allow electricity to flow through.

11- Metals lose their metallic luster when exposed to humid air.

12- Metals forming a layer of rust when they left in air for some days.

13- Metals which find great difficulty in reacting with oxygen of the air.

14- It is the smallest building unit of the matter that can exist freely.

15- They are the spaces that are found among the molecules of the matter

16- It is the force that binds the molecules of the matter together.

17- They have definite shape and volume.

18- They have indefinite shape and definite volume.

19- They have indefinite shape and indefinite volume.

20- It is the change of matter from solid state to liquid state.

21- It is the change of matter from liquid state to gaseous state.

22- The simplest pure form of matter which can't break down into simpler form.

23- It is a substance which is formed from the combination of different elements.

24- It is the fundamental building unit of matter.

25- The smallest individual unit of matter which can share in chemical reaction.

26- Positively charged particles exist inside nucleus.

27- Neutral particles exist inside nucleus.

28- Negatively charged particles revolve around nucleus.

29- The number of protons inside nucleus.

30- The sum of numbers of protons & neutrons inside nucleus.

31- They are imaginary regions around the nucleus in which electrons revolve in.

32- It is the amount of energy gained or lost by an electron to transfers from energy level to another.

33- It is the atom that gains a quantum of energy.

34- Elements that have completely filled outermost energy level.

35- Elements take part in a chemical reaction.

② Write the mathematical relation that bind between:

1- Density, mass & volume.

2- Atomic number.

3- Mass number.

4- Neutrons number.

5- The number of electrons in each energy level.

3 Give an example for:

1- A substance float on water.	
2- A substance sinks in water.	
3- A gas has density lower than air.	
4- A substance has low melting point.	
5- A substance has high melting point.	
6- Alloy used in making jewels.	
7- Alloy used in making heating coils.	
8- Solid substance soft at room temperature.	
9- Solid substance soft by heating.	
10-Solid substance cannot be soft by heating.	
11- A substance conducts heat.	
12- A substance does not conduct heat.	
13- A substance conducts electricity.	
14- A substance does not conduct electricity.	
15- A Solution conducts electricity.	
16- Very active metal.	
17- Less active metal.	
18- Inactive metal.	
19- A substance used to plate other metals.	
20- A solid matter.	
21- A liquid matter.	
22- A gaseous matter.	
23- Mono-atomic liquid.	
24- Di-atomic liquid.	

24- Active gas.	
25- Nobel (inert) gas.	
26- A compound contains two atoms.	
27- A compound contains three atoms.	
28- A compound contains four atoms.	
29- Element has no neutrons inside its nucleus.	

❹ Write the name of the following symbols:

1- H	2- He	3- O
4- N	5- Ne	6- Na
7- C	8- Ca	9- Cl
10- Cu	11- Ag	12-Au
13- Mg	14- Zn	15-Fe
16- B	17- Br	18-I
19- Pb	20- Ar	21-Li
22- K	23- F	24-Au
25- Al	26- Hg	27-Si
28- P	29- Be	30-Cr

5 Complete the following table:

Element symbol	Atomic number	Mass number	protons	electrons	Neutrons	Electronic configuration	Chemical activity
$^{1}_{1}H$							
$^{4}_{2}He$							
$^{7}_{3}Li$							
$^{14}_{7}N$							
$^{23}_{11}Na$							
$^{24}_{12}Mg$							
$^{32}_{16}S$							
$^{27}_{13}Al$							
$^{40}_{18}Ar$							

6 Compare between:

Point of comparison	Substance float on water	Substance sink in water
Example		
Reason		

Point of comparison	Substances have high melting point	Substances have low melting point
Example		

Point of comparison	Melting point	Boiling point
Definition		

Point of comparison	Melting	Boiling
Definition		

Point of comparison	Soft solid substances	Solid substances soft by heating	Solid substances Can't soft by heating
Examples			

Point of comparison	Good conductors of heat	Bad conductors of heat
Example		

Point of comparison	Good conductors of electricity	Bad conductors of electricity
Example		

Point of comparison	Active metals	Less active metals	Inactive metals
Example			

	Solid	Liquid	Gas
1. Motion of molecules			
2. Intermolecular spaces			
3. Intermolecular force			
4. volume			
5. Shape			
Examples			

Point of comparison	Element	Compound
Definition		
Examples		

Point of comparison	Protons	Neutrons	Electrons
Charge			
Location			
Mass			

Point of comparison	Atomic number	Mass number
Definition		

Point of comparison	Active element	Inactive element
Definition		

7 Complete the following:

1- We use …… property to differentiate between gold & silver.

2- We use …… property to differentiate between sugar & salt.

3- We use …… property to differentiate between vinegar & perfume.

4- A piece of wood has a density of 0.4 g/cm³ will …… water.

5- …….. & …… float on water surface.

6- …….. & …… sink in water.

7- Equal volumes of different materials have …… masses.

8- …….. & ……. Gases used in filling balloons during festivals.

9- Water density is ……. While its melting point is …….. and its boiling point is ……

10- Solids have …….. shape and …….. volume.

11- Liquids have …….. shape and …….. volume.

12- Gases have …….. shape and …….. volume.

13- Iron has …….. spaces among its molecules.

14- The intermolecular force in mercury is ……..

15- On heating ice, the speed of molecules …….

16- Melting process reverses …….. Process.

17- Boiling process reverses …….. Process.

18- The mono atomic liquid is …… While the di-atomic liquid is ……

19- Nucleus of …… does not contain neutrons.

❽ Study the opposite figures then answer:

1. **If you know that the density of natural milk is 1.03 gm/cm^3, how do you recognize the quality of milk you have bought ?**

2. **Classify the following substances according to the chemical activity.**
   [Chromium - Sodium - Nickel - Iron - Aluminium - Gold - Platinum - Potassium

3. **In the following two figures after the key is closed. In which figure does the lamp illuminate ? Why ?**

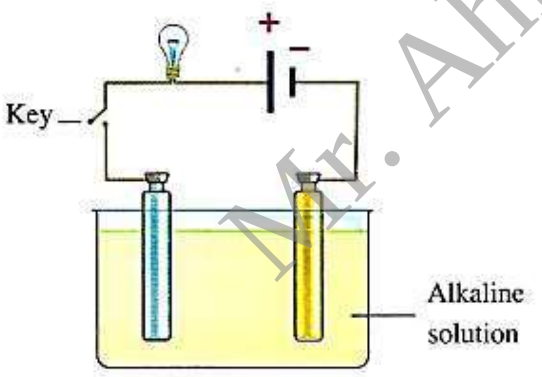


Fig. (A)

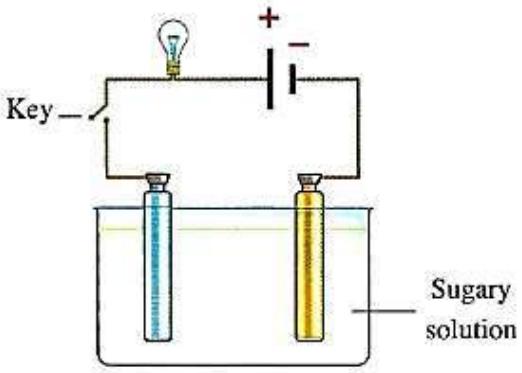
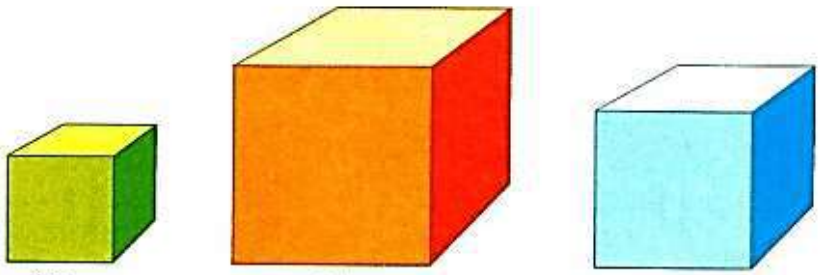


Fig. (B)

4- **Arrange the following cubes ascendingly according to the density. Knowing that they have the same mass.**

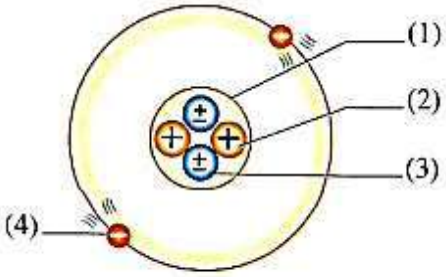


(1) (2) (3)

5- **Which of the following figures represents the element molecule and which of them represents the compound molecule ? Why ?**

Fig. (1) Fig. (2) Fig. (3) Fig. (4) Fig. (5)

6- **The following figure represents a sketch of the atom of an element.**
Label the figure.



7- 📖 **The following figures represent a sketch of the electronic configuration of the atoms of some elements.**

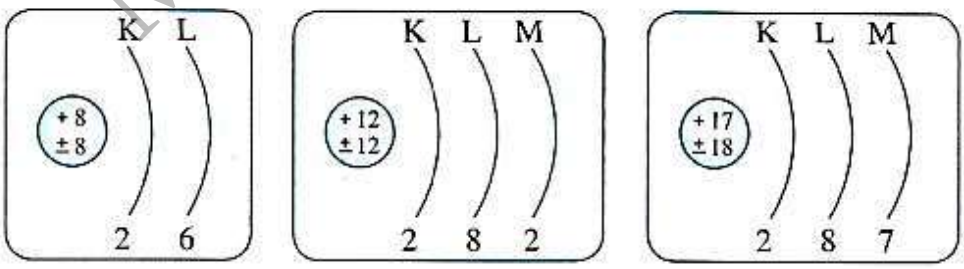


Fig. (1) Fig. (2) Fig. (3)

Conclude the following in each atom :

1. Atomic number.
2. Mass number.
3. No. of electrons in the outermost level.
4. The number of energy levels having electrons.

9 What happen if:

1. **The electron gains quantum energy.**

   It transfers to higher energy level.

2. **The electron loses quantum energy.**

   It transfers to lower energy level.

9 Give reason for:

1- The cork & wood float on the water surface.

Because the density of wood & cork is less than the density of water.

2- The glass & Iron sinks in the water.

Because the density of glass and Iron is more than the density of water.

3- Equal volumes of different materials have different masses.
Equal masses of different materials have different volumes.

Because they have different densities

4- Water cannot put out petrol fires.

Because the density of the oil is less than the density of the water so, it floats over the water and cannot put out the fire.

5- Hydrogen or Helium balloons rise up in air.

Because the density of helium and hydrogen is less than the density of the air so, it rises up in the air.

6- Cooking pans (pots) are made of aluminum or stainless steel.

Because aluminum or stainless steel alloy have high melting point.

7- The separation of the components of petroleum oil by heating.

Due to the difference between them in their boiling points and by heating the crude oil, then separation each substance at its boiling point.

8- The screwdrivers are made of steel iron

Because it is very hard.

9- The rods used in building concrete houses are made of iron n't copper.

Because the hardness of iron is more than copper.

10- Cooking pans are made of Aluminum.

Because aluminum is a good conductor of heat.

11- Handles of cooking pans are made of plastic or wood.

Because plastic and wood are bad conductors of heat.

12- Electric wires (cables) are made up of copper or aluminum and covered with plastic wire .

Because aluminum and copper are good conductor of electricity, while plastic is a bad conductor of electricity.

13- Electric screwdriver are made up of steel irons, while their handles are made up of wood or plastic.

Because steel iron is a good conductor of electricity, but wood and plastic are bad conductors of electricity.

14- Sodium and potassium are kept under kerosene surface.

To prevent their reaction with oxygen of the air.

15- Steel bridges and the holder of light bulbs are painted every time.

To protect them from rust and corrosion.

16- Metallic spare parts of cars are covered with grease.

To protect them from rust and corrosion.

17- Aluminum cooking pans are washed with a rough material.

To remove any layer formed on them.

18- Gold and silver are used in making jewels.

Because they are chemically inactive.

19- Gold, silver and nickel are used to cover active metals.

To protect them from rust and corrosion.

20- Perfume odor spreads through air.

21- Permanganate violet color spreads through water.

22- A drop of ink spreads through water.

Because the molecules of ……. are in a state of continuous motion and they keep the properties of matter.

23- The volume of mixture of water & alcohol is less than sum of their volumes

Because some molecules of the alcohol occupy the intermolecular spaces among the water molecules.

24- It is very hard to break iron piece with your hand.

Because, the intermolecular forces among the molecules of **solids** such as (iron) are **very strong**.

25- It is very easy to divide water in small cups.

Because, the intermolecular forces among the molecules of **liquids** such as (water) are **weak**.

26- Some element symbols are written in two letters.

Some element are common in their first letter so the second letter is taken to differentiate between them.

27- Nucleus of the atom is positively charged.

Because it contains +ve Protons and ±ve neutrons.

28- The atom is electrically neutral.

Because it contains +ve Protons and -ve electrons and they are equal.

29- Mass of atom is concernated in nucleus.

Because the electron mass is neglected relative to protons & neutrons.

30- Mass number always is greater than atomic number.

Because the mass number equal the sum of protons and neutrons inside atom but atomic number equal the number of protons only.

31- The nucleus of hydrogen doesn't contain neutrons.

Because the atomic number equals the mass number equal one.

32- This rule $2n^2$ works only with the first four energy levels.

Because the atom will be unstable.

33- Nobel gases don't enter a chemical reaction.

Because the outermost energy levels are completely filled with electrons.

⑩ Problems:

Problem no 1:

A piece of Iron has a volume of 10 cm^3 and a mass of 78 gm, Find its density.

Problem no 2:

A piece of wood has a density of 0.4 g/cm^3 & a volume of 20 cm^3. Find its mass.

Problem no 3:

On determining iron density using a piece of iron whose mass is 78 gm ,the iron piece is immersed in 100 cm^3 of water, the water rises up to 110 cm^3,find its density.

Problem no 4:

In an experiment for determining the density of a liquid , the following results are recorded :

- ***The mass of an empty beaker = 75 gm.***
- ***The mass of the beaker containing liquid = 135 gm.***
- ***The volume of the liquid (measured by graduated cylinder) = 100 cm^3.***

Calculate the density of liquid.

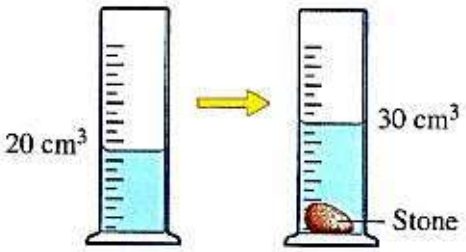
5- From the opposite figure :

a. Calculate the volume of the stone.

b. If the mass of the stone = 80 gm. What's the density of this stone ?

c. If this stone is placed in a jar containing mercury. Does it sink or float ? Give a reason.

[knowing that the density of mercury is 13.6 gm/cm^3].



Problems

1. ***If the nucleus of an oxygen atom contains 8 protons and 8 neutrons, find the atomic number and the mass number of oxygen and how the symbol of oxygen element is written.***

2. ***If the nucleus of a sodium atom contains 11 protons and its mass number is find the atomic number and the number of neutrons.***

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Unit 2

Droos Science

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1 Write the scientific term:

1- It is the ability to do work or to make a change.

2- The measuring unit of energy.

3- The measuring unit of force.

4- The permanent source of energy.

5- It is the energy stored in the object due to work done on it.

6- It is the energy of the object due to its motion.

7- It the summation of potential and kinetic energies.

8- A device used to convert chemical energy to electric energy.

9- Energy is neither created nor destroyed but it changed from to another.

10- A form of energy which is transferred from a hot object to cold one.

11- A heat condition states the direction of heat from object or to it.

12- It is the transfer of heat through solid materials.

13- It is the transfer of heat through liquid and gases materials.

14- It is the transfer of heat without needing to medium.

2 Write the mathematical relation that bind between:

1- Work & force.

2- Weight & mass.

3- Weight & height.

4- Mass & speed.

5- Potential & kinetic energies.

3 Choose the correct answer:

1- …….. is a permanent source of energy.

a- Petrol b- Coal c- The sun d- Electric lamp

2- Food and fuel are sources of …… energy

a- mechanical b- chemical c- electric d-sound

3- …… is example for clean source of energy.

a- Petrol b-Coal c- Natural gas d- Wind

4- When object launched up, it speed ……

a-increases b-decreases c- remains constant

5- When object falls down, it speed ……

a- increases b- decreases c- remains constant

6- As the speed of object doubled, its kinetic ……..

a-doubled b-decrease to half c- increase four times

7- The mechanical energy at highest point equals ……..…energy

a-Potential b-Kinetic c- zero

8- The change of energy in pendulum is similar to those occurs in …….

a-dynamo b-motor c- children's swing

9- Electric energy is converted into kinetic energy in …….

a-motor b-dynamo c- solar cell

10- kinetic energy is converted into electric energy in …….

a- motor b- dynamo c- solar cell

11- Solar energy is converted into electric energy in …….

a-solar heater b-solar oven c- solar cell

12- Chemical energy is converted into electric energy in …….

a-motor b-solar cell c- simple electric cell

13- By increasing kinetic energy of particles, their ……. increase

a-weight b-temperature c- volume

14- Heat transferred through solid by …….

a-conduction b-convection c- radiation d- b & c

15- Heat transferred from sun to earth by …….

a- conduction b- convection c- radiation d- b & c

16- Heat transferred from electric heater to you by …….

a- conduction b- convection c- radiation d- b & c

17- Which of the following devices pollute the environment.

a-Gas oven b-Solar oven c- Electric oven

18- Which of the following devices doesn't pollute the environment.

a-Gas oven b-Solar oven c- Coal heater

4 Compare between:

Point of comparison	Potential energy	Kinetic energy
Definition		
Rule		
Factors affecting it		
Example		

Point of comparison	Conduction	Convection	Radiation
Definition			

Point of comparison	Solar oven	Electric oven	Gas oven
Source of energy			
Kind of source			
Effect on environment			

5 Complete the following table:

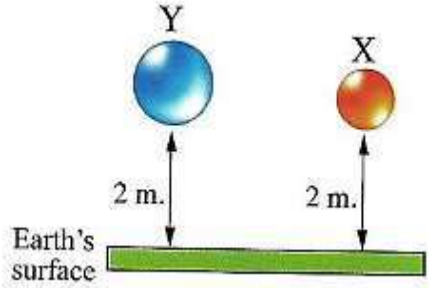
Application	*Energy transformation*	
	Energy used	*Energy produced*
Electric lamp		
Electric iron		
Electric fan		
Sewing machine		
Electric heater		
Air conditioner		
Television		
Radio (cassette)		
Filament of lamp		
Electric bell		
Cellular phone		
Dynamo		
Motor		
Solar cell		
Nuclear reactor		
Simple electric cell		
Simple pendulum		
Friction		
Photosynthesis		

Application	*Negative effect*
1- Car exhaust	
2- Chemical pesticides	
3. Military explosions	
4. Nuclear weapons	
5.The network of wireless transmitters of cellular phones	
6- Loudspeakers & drilling machines	

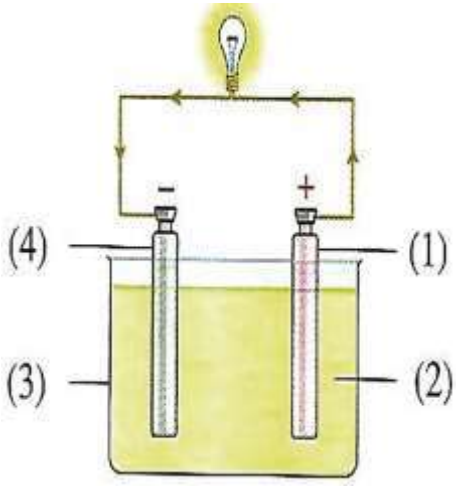
❻ Study the opposite figures then answer:

1. **If the truck and car move with equal speed, Which one has more kinetic energy and why?**

2. **Which of two balls has more potential energy and why?**



3. **Study the following figure then answer the following questions?**



a) What the name of this device.

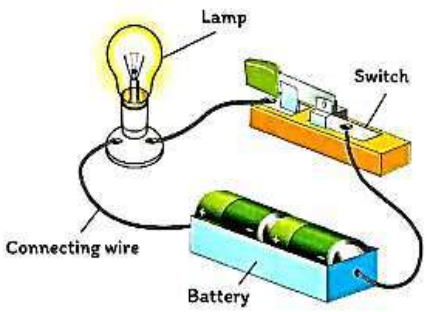
b) What is the idea of operation?

c) What is the direction of electricity?

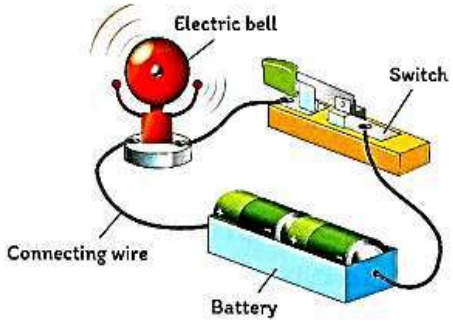
d) Label the following figure:

1. ……. 2. …….. 3. ……. 4…….

4- ***From the opposite two circuits, answer the following questions:***



Circuit (1)



Circuit (2)

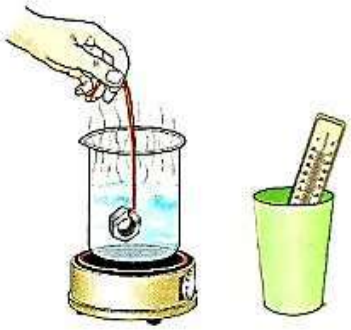
a. What is the energy transformation that happen in two circuits?

b. What do you feel when touching electric lamp after closing key in circuit (1)?

c. Which of two circuits is suitable for attention of deaf person and blind person?

5. **In the opposite figure :**

- If the temperature of water in the beaker is 100°C.
- If the temperature of water in the cup is 20°C.
- If the nut fastener is transferred from the beaker to the cup.



Choose the correct answer :

1. The temperature of water in the cup becomes ..... 20°C.

a. less than b. more than c. equal to

2. The temperature of the nut fastener only becomes ..... 100°C.

a. less than b. more than c. equal to

3. The temperature of the nut fastener and water together in the cup may become .....

a. 5°C. b. 25°C. c. 100°C.

7 What meant by:

Energy	
Potential energy	
Kinetic energy	
Mechanical energy	
Law of conservation of energy	
Heat energy	
Temperature	
Transfer of heat by conduction	
Transfer of heat by convection	
Transfer of heat by radiation	

8 What happen if:

1. **The force doubled (concerning work)?**

   The work will be doubled.

2. **The displacement doubled (concerning work)?**

   The work will be doubled.

3. **The Force doubled and displacement decreased to half (concerning work)?**

   The work remains constant.

4. **The height doubled (concerning P.E)?**

   The potential energy will be doubled.

5. **The weight doubled (concerning P.E)?**

   The potential will be doubled.

6. **The mass doubled (concerning K.E)?**

   The kinetic energy will be doubled.

7. **The speed doubled (concerning K.E)?**

   The kinetic energy increase four times.

8. **The object reaches the maximum height (concerning P.E)?**

   The potential become maximum value.

9. **When copper wire and zinc plate are dipped inside a lemon after connecting them to compass?**

   The needle of the compass is deflected because chemical energy inside lemon changes to electric energy.

10. **You put the freezer in the bottom of the fridge**

    The bottom of the fridge only is cooled because the cold air (of high density) doesn't rise up.

11. **You place the electric heater in the upper part of the room?**

    The upper part of the room only is heated because the hot air (of low density) doesn't fall down.

9 Give reason for:

1. **The person who pushes a wall doesn't do any work.**

Because the displacement equal zero.

2. **The fuel in the car is similar to the food in the body..**

Because both burn and produce energy which makes the car move and the living organisms do work.

3. **Some countries try to use the solar energy, wind energy and the movement of water to generate electricity.**

1. *Because sun is a permanent source of energy, while wind and water movement are renewable sources of energy.*
2. *Because they are cheap, clean and don't pollute environment.*

4. **When object move horizontally, its potential energy doesn't change.**

Because the height doesn't change.

5. **The motion of children's swing is look like motion of pendulum.**

Because, P.E & K.E are exchanged without ending and their Summation (mechanical energy) at any point remains constant.

6. **K.E increases when pendulum approaches to rest (equilibrium) point.**

Because its velocity increases where the kinetic energy depends on the velocity of the object

7. **P.E increases when pendulum goes away from rest point.**

Because its height increases where the potential energy depends on the height of the object.

8. **Mechanical energy of any object at any moment is constant.**

Because the increase in potential energy of the object equals the decrease in its kinetic energy and vice versa..

9. **As K.E increase, P.E decreases and vice versa.**

Because the relation between them is indirect relation.

10. **You feel warm when you rub your hands together.**
11. **The nail gets hot when you pull it from the wooden piece.**
12. **Burning a match sick when it contact a rough surface**

Because Friction converts kinetic energy into heat energy.

13. **When you touch a hot cup of tea you feel hot?**

Because heat transfers from the hot cup to the cold one (your hand) by conduction.

14. **Making cooking pans of copper or aluminum.**

Because they are good conductors of heat.

15. **The freezer of the fridge is found at the top of the fridge.**

Because when air is cooled, its density increase, so it falls down to cool the food in the refrigerator , while the hot air with low density rises up to be cooled again and so on.

16. **The electric heater is placed at the lower part of the room**

Because when the air around the heater is heated, its density decreases, so it rises up while cold air with high density falls down to be heated and so on.

17. **Wearing dark clothes in the winter.**

To absorb heat of the sun.

18. ***Wearing light clothes in the summer.***

To reflect the sun rays.

19. **The heat of the Sun reach to the Earth by radiation only.**

Because there is a space between sun & earth.

اللهم إنى أستودعك ما قرأت و ما فهمت و ما حفظت
فرده لى عند حاجتى له إنك على كل شئ قدير.

⑩ Problems:

Problem no 1:

Calculate the work done by a fireman to lift a force of 65 Newton in a distance of 10 meters height.

Problem no 2:

If the work done to move box 2 meters equals 40 joules, calculate force.

Problem no 3:

A force of 10 newton affects a body of mass 5 kg but the body doesn't move, find work done.

Problem no 4:

An object, whose mass is 2.5 kg and it is at a height of 4 m calculate its P.E.

(acceleration due to gravity = 10 m/sec^2)

Problem no 5:

Find the weight of an object of potential energy 88 joules when it found at height 11 m.

Problem no 6:

Calculate the height of an object from earth's surface, knowing that the object weight is 4 N and its potential is 10 joules.

Problem no 7:

A racing bike move with speed 20 m/s, calculate its kinetic energy knowing that the mass of bike is 8 kg.

Problem no 8:

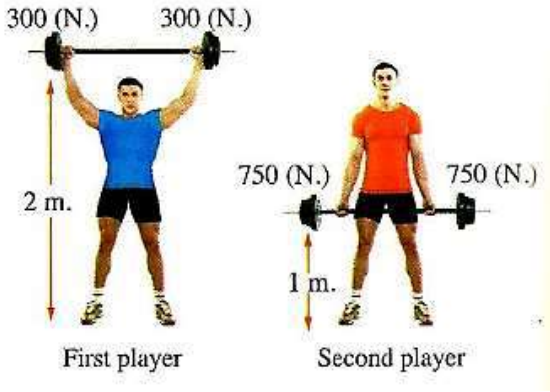
Find the mass of an object of kinetic energy 50 joules and its speed 5 m/s.

Problem no 9:

Find the speed of an object of kinetic energy 1000 joules and its mass is 80 kg.

Problem no 10:

From the following figure which one has more stored energy?



Problem no 11:

Calculate the mechanical energy of object whose kinetic energy is 500 j and its potential energy is 1000 j

Problem no 12:

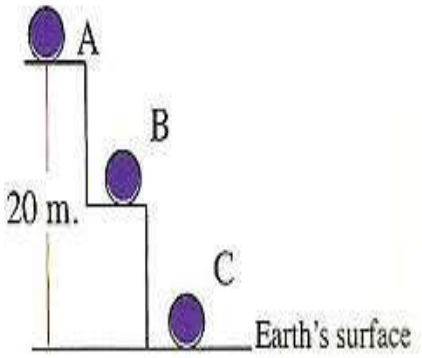
A stone has a mass of 0.4 K.g was thrown up and reached a height of 5 m, then its velocity was 4 m/sec. Calculate the following:

a. P.E b. K.E c. M.E (Work done) ($g=10m/s^2$)

Problem no 13:

The opposite figure represent a ball whose weight 10 N falls from A to C, Complete the following table:

Point	A	B	C
P.E			
K.E			



Problem no 14:

Someone kicked a ball of mass 0.5 kg and weight 5 N vertically upward, at height 4 m its speed was 10 m/sec calculate:

- ***a- The potential energy at 4 m height.***
- ***b- The work done on the ball.***
- ***c- The maximum height which ball reached***

Problem no 15:

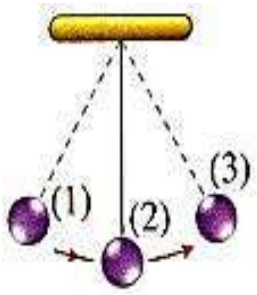
A stone of mass 5 kg falls from height 8 m calculate its : P.E & K.E at

a- The beginning of falling.
b- The ground.
c- The middle height.
d- Height 6 m.

(acceleration due to gravity = 10 m/sec^2)

Problem no 16:

From the following figure, if the mechanical energy of the pendulum is 40 j Calculate its potential and kinetic energies at points (1) & (2).



Problem no 17:

From the following figure, the mass of pendulum is 0.5 kg and its speed is 6 m/s , calculate the kinetic energy and potential energy at rest point.

Problem no 18:

A moving pendulum has a potential energy of 0.8 joule at maximum displacement, if the mass of pendulum is 0.16 kg, Calculate:

a. ***The height of pendulum (h).***
b. ***Kinetic energy at point (B).***

(acceleration due to gravity = 10 m/sec^2)

Science
Pre.1
Term 1
2022

Unit 3

Droos Science

Mr. Ahmed Omara

Droos science

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❶ Write the scientific term:

1- Living organisms that can't be seen by the naked eye.

2- Plants can't be distinguished into roots, stems and leaves.

3- They are small terrestrial plants reproduce by formation of spores.

4- They are plants reproduce by formation of seeds inside cones.

5- They are plants reproduce by formation of seeds inside pericarp.

6- Invertebrate animals characterized by the presence of jointed legs.

7- A group of arthropods having three pairs of jointed legs.

8- A group of arthropods having four pairs of jointed legs.

9- A group of arthropods having numerous legs.

10- It is the branch of biology that searches for the similarities and differences among living organisms and place similar in same groups.

11- It is a group of similar living organisms that can reproduce.

12- It is a modification of a living organism's behavior, body structure, or organs functions to become more adapted to the environment.

13- It is a modification in the structure of body to adapt the environment.

14- It is the ability of some body organs and tissues to do a specific function.

15- It is a modification in the activity of some animals at certain times

16- They are autotrophic green plants that can’t absorb the nitrogenous substances from the soil and digest it from insects.

17- Behavior adaptation in which animal dormant in winter.

18- Behavior adaptation in which animal dormant in summer.

19- Inherited behavior of some birds to move from cold to warmer regions.

20- The ability of animal to be hidden from enemies or to capture preys.

2 Choose the correct answer:

1- All these animals lived in water except ……

a- dolphins b- crocodile c- horse d- hippopotami

2- Amoeba, euglena and paramecium differ in …….

a- shape b- way of movement c- a & b d-no correct answer

3- …… is example for plant reproduce by formation of spores.

a- Adiantum b-Pine c- Bean d- Palm

4- Cycas belongs to ……..

a-Ferns b-gymnosperm c- angiosperm d- insectvorous

5- Bean belongs to ……..

a-Ferns b-gymnosperm c- angiosperm d- insectvorous

6- Maize belongs to ……..

a-Ferns b-gymnosperm c- angiosperm d- insectvorous

7- Adiantum belongs to ……..

a-Ferns b-gymnosperm c- angiosperm d- insectvorous

8- Drosera belongs to ……..

a-Ferns b-gymnosperm c- angiosperm d- insectvorous

9- Arthapods are classified into all the following except …….

a-insect b-rodents c- arachnid d- myriabod

10- Insect has …… pairs of legs.

a-3 b-4 c- 6 d- 8

11- Arachnids has …… legs.

a-3 b-4 c- 6 d- 8

12- …… is edentate mammal.

a-Hedgehog b-Armadillo c- Jerboa d- Rabbit

13- Taxonomy is branch in ……

a-Biology b-chemistry c- physics d- Rabbit

14- …….. is the scientist who use specie.

a-Newton b-Linnaeus c- Bohr d- no correct answer

15- Mammals moves in different ways except ……..

a-running b-swimming c- climbing d- absorption

16- Predatory birds have …….. beaks.

a-Wide indented b-crooked c- long thin d- short

17- Water birds have …….. beaks.

a-Wide indented b-crooked c- long thin d- short

18- Hawk has …… interior fingers.

a-1 b-2 c- 3 d- 4

19- …….. is a rodent undergo aestivation.

a-Rat b-Squirrel c- Jerboa d- no correct answer

20- Bird migration is ……. behavior.

a-accepted b- inherited c- common d- no correct answer

3 Compare between:

Point of comparison	Gymnosperm	Angiosperm
Definition		
Examples		

Point of comparison	Monocotyledon	Di-cotyledon
Examples		

Point of comparison	Animals with internal support	Animals with external support
Examples		

Point of comparison	Insect	Arachnids	Myriabod
Number of jointed legs			
Examples			

Point of comparison	Rodent	Lagomorph
Definition		
Examples		

Point of comparison	Anatomical adaptation	Behavior adaptation	Functional adaptation
Definition			
Examples			

Point of comparison	Hawk	Heron	ducks
Beaks			
Legs			

Point of comparison	Hibernation	Aestivation
Type of adaptation		
Time of occurrence		
Reason of adaptation		
Examples		

4 Choose the odd word:

a. Amoeba – Euglena – Cilia – Paramecium

b. Vougheir – Pine – Adiantum - Ferns

c. Bean – Maize – Pea - cycas

d. Cockroach – spider – mosquitoes - fly

e. Swimming – flying – climbing – respiration.

f. Dionea – drosera – palm – halophile.

g. Frogs – jerboa – reptiles.

5 Give an example for:

1- A big size animal.	
2- A small size animal.	
3- Animal live in water.	
4- Animal live on land.	
5- Huge tree.	
6- A Plant with short weeds.	
7- A plant carries long size leaves.	
8- A plant carries short size leaves.	
9- Micro-organisms.	
10- A plant has roots, leave and stem.	
11- A plant has not roots, leave and stem.	
12- Fern plant (reproduce by spores).	
13- A gymnosperm plant.	
14- Angiosperm plant.	
15- Monocotyledon plant.	
16- Di-cotyledon plant.	
17- Animal with soft body.	
18- Animal with internal support body.	
19- Animal with external support body.	
20- Animal with internal & external support body.	
21- An insect.	
22- An arachnid.	
23- A myriabod.	

24- Edentates mammal	
25- Animal with front teeth extending outward.	
26- Animal with molar and canines.	
27- A rodent animal.	
28- A lagomorph animal.	
29- Animal can run on rocky soil.	
30- Animal whose limbs end with thick flat pad.	
31- Anatomical adaptation.	
32- Functional adaptation.	
33- Behavior adaptation.	
34- A mammal whose front limb is paddles.	
35- A mammal whose front limb is wings.	
36- A mammal with elongated limb and finger.	
37- A predatory bird.	
38- A bird feed on worms and snails.	
39- A bird feed on mosses.	
40- Insectivorous (predacious) plant.	
41- Animal hibernates.	
42- Animal aestivates.	
43- Bird migrates.	
44- Insect look like a plant leaf.	
45- Insect hardly discovered on the branches of plant	
46- Animal undergoes camouflage.	

6 What is the type of adaptation:

1- A solid end in horse.	
2- A thick flat end in camel.	
3- Secreting sweet in human.	
4- Quail bird migration.	
5- Dolphin paddles.	
6- Bats wings.	
7- Secreting poison in snake.	
8- Hibernation.	
9- Aestivation.	
10- Leaf insect.	
11- Sharp and strong crooked beaks of hawk.	
12- Chameleon hides by camouflage.	

7 Look at the opposite figure then complete:

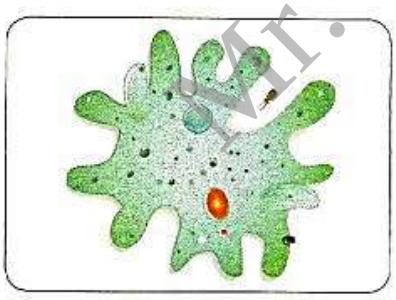


Fig. (1)

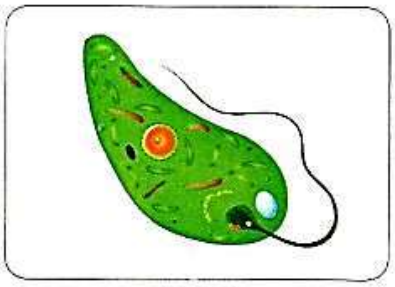


Fig. (2)

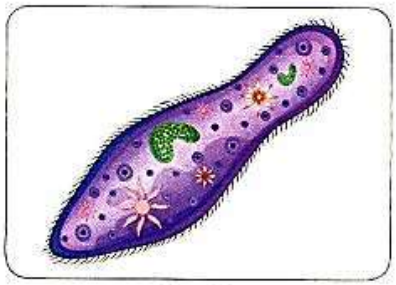


Fig. (3)

1. Fig (1) represents ..... and it moved by ..... .
2. Fig (2) represents ..... and it moved by ..... .
3. Fig (3) represents ..... and it moved by ..... .
4. They similar as they are .....
5. They different in ..... & .....

⑧ What meant by:

1-Taxonomy	
2-Species	
3-Micro-organisms	
4-Gymnosperms	
5-Angiosperms	
6-Arthropods	
7-Insects	
8-Arachnids	
9-Myriapods	
10-Adaptation	
11-Anatomical adaptation	

12-Behaviour adaptation	
13-Functional adaptation	
14-Insectivorous plants	
15-Hibernation	
16-Aestivation	
17-Birds migration	
18-Camouflage	

9 What happen if:

1. **The forelimbs of dolphin are not modified into paddles?**

   It becomes unable to swim or dive in water.

2. **The forelimbs of bat are not modified into wing-like structures?**

   It becomes unable to fly.

3. **The forelimbs of monkey are short?**

   It becomes unable to climb trees or catch objects.

4. Ending of camel's legs with a strong hoof ?

It becomes unable to walk on desert sand and its leg will sink in sand.

5. The beaks of predatory birds are long and thin?

They become unable to tear the prey's flesh.

6. The beaks of heron are not long and thin?

They become unable to pick up snails or worms.

7. ducks and geese haven't indented wide beaks?

They become unable to eat or filter food from water.

8. The legs of predatory birds is without claws?

They become unable to firm pouncing the prey.

9. Duck or geese lost its palm legs?

They become unable to swim in water.

10. The front teeth of hedgehog are not extending outwards.?

They become unable to capture insects.

11. Mating between a donkey and horse?

The produced offspring will be mule.

13 .Frog does not make hibernation in winter?

They will die due to the extreme cold weather.

14 . Quail birds do not migrate in winter from cold to warmer place?

They will be unable to make reproduction process and may may die.

15 .Chameleon goes from green area to sandy area?

Its color will change from green to yellow.

16. Chameleon can't make camouflage?

It can't capture its insect preys and may be seen by its enemies.

⑩ Give reason for:

1. **Paramecium belongs to micro-organisms.**

   Because it can't be seen by the naked eye, but can be seen only by microscope.

2. **Vougheir and adiantum are classified as ferns.**

   Because they reproduce by formation of spores.

3. **Pine plant belongs to gymnosperms.**

   Because it reproduces by formation of seeds inside cones.

4. **Algae differs from most of plants.**

   Because algae can't be distinguished into roots, stems and leaves.

5. **Maize and bean plants are classified as angiosperms.**

   Because these plants reproduce by forming seeds inside a pericarp.

6. **Octopus and jellyfish have soft bodies.**

   Because their bodies don't have a support.

7. **Locust is classified in insects.**

   Because it has three pairs of jointed legs.

8. **Scorpion is classified in arachnids.**

   Because it has four pairs of jointed legs.

9. **Scolopendra and julius are classified as myriapods.**

   Because they have a large number of jointed legs.

10. **The front teeth of hedgehog are extending outwards.**

    To capture insects.

11. **Sloth and armadillo are classified as edentates.**

    Because they do not have teeth.

12. **Rat is from rodents, while rabbit is from lagomorphs.**

    Because rat has one pair of incisors in each jaw, while rabbit has two pairs of incisors in the upper jaw and one pair in the lower jaw.

13. **Scientists classified living organisms into groups.**

To facilitate their study.

14. **The camel's limb ends with a thick flat pad.**

To enable it to walk on hot desert.

15. **The horse's limb ends with a strong solid hoof.**

To enable it to walk on rocky soil.

16. **The forelimbs of dolphins are modified into paddles.**

To perform the function of swimming and diving in water.

17. **The two forelimbs of bats are modified into wing structures.**

To perform the function of flying.

18. **The forelimbs and fingers in monkey are elongated.**

To enable it to climb trees and catch things.

19. **The beaks of predatory birds are strong and sharp crooked.**

To tear the prey's flesh.

20. **The legs of hawks ending with strong sharp claws.**

To firm pouncing the prey.

21. **The beaks of heron and hoopoe are long and thin.**

To help them pick up worms and snails.

22. **The beaks of water birds are wide and intended.**

To help them to filter their food from water.

23. **The legs of water birds that feed on worms are long and thin.**

To help them in swimming.

24. **Modification of bird's beaks.**

To suit the kind of food.

25. **Frogs hibernate in winter**

To overcome the decrease of temperature in winter.

26. **Jerboa aestivate in summer**

To overcome the increase of temperature and shortage of water in summer.

27. **Quail bird migrate in winter**

To find more lighted and warmer regions for reproduction.

28. **Chameleon undergoes camouflage**

To hide from its prey or to hide from enemies.

29. **Leaf insect is hardly discovered by its enimes.**

Because it looks like the leaf of plant.

30. **Stick insect is hardly discovered by its enimes.**

Because it looks like the branches of plants.

31. **Camel is called desert ship.**

Because it considered the most adapted animal that can live in the desert and it undergo all kinds of (Structural-Functional-Behaviour) adaptations.

اللهم إنى أستودعك ما قرأت و ما فهمت و ما حفظت
فرده لى عند حاجتى له إنك على كل شئ قدير.

Unit 1

(Matter and its Construction)

Lesson 1 (Matter and its Characteristics)

- **Choose the correct answer :**

1- The density of helium is.....that of air.

a. less than

b. more than

c. equals to

2- The density of petroleum oil is.....that of water.

a. less than

b. more than

c. equal to

d. no correct answer

3- Density measuring unit is .....

a.cm^3.

b. gm.

c. gm./cm^3

4-The property of electric conduction is distinguishing factor between .....

a. iron and copper.

b. wood and plastic.

c. iron and wood.

d. plastic and glass

5- The mass of a piece of rock whose density is 2.8 gm/cm^3 is 28 gm, so the density of 280 gm of it is .....gm/cm^3 .

a.280

b.28

c.2.8

d.28.5

6-Balloons of festivals are filled with .....gas.
a.oxygen
b.nitrogen
c.carbon dioxide
d.helium

7-All of the following solutions are electric conductors except.....
a.salt
b.alkaline
c.acidic
d.sugary

8-Some substances need heat to become soften such as.....
a.coal
b.iron
c.sulphur
d.rubber.

9-The smell property is a distinguishing factor between.....
a. iron and gold
b. wood and plastic
c. perfume and vinegar
d.sugar and salt.

- **Complete the following sentences:**

1-The measuring unit of mass is ....., while ..... is the measuring unit of density.
2-.....and.....are very active metals.
3-.....is soft at room temperature, while.....can't be soften.
4-An alloy of .....is used in making jewels, but.....alloy is used in making heating coils.
5-.....is from very active metals but.....is from inactive metals.
6-In the melting process, solid molecules ....energy and change into .....state.

7-.....solution is a good conductor of electricity, but.....solution is a bad conductor of electricity.

8-Matter is anything that has..... and .....

- **Write the scientific term:**

1. A liquid used to keep sodium and potassium metals from air. (.....)
2. The temperature at which a solid substance starts to change into liquid. (.....)
3. Temperature at which liquid state changes into gaseous one. (.....)
4. An alloy which is used in making heating coils. (.....)
5. It is the mass of unit volume of the substance. (.....)

- **Cross the odd word:**

1. Iron - Copper -Aluminium - Wood.
2. Butter - Ice - Iron - Wax.
3. Ice- wood- oil – iron nail.

- **Correct the underlined words :**

1. From substances that float on the surface of water is copper.
2. Gold is from very active metals.
3. Copper-gold alloy is used in making heating coils.

- **Put (✓) or (×) :**

1. Jewels are made up of copper-gold alloy. ( )
2. Wood and copper are bad conductors of electricity. ( )
3. Water is used to put out petrol fires. ( )

- **Give reason:**

1. Manufacturers heat metals to be molten.

.....

2. Water isn't put out petrol fires.

.....

3. A copper coin sinks in water.

.....

4. Wood floats on water surface.

.....

5. Iron rods not copper rods are used in building concrete houses.

.....

6. Cooking pots are made up of aluminum, while their handles are made up of plastic.

.....

7. Sodium and potassium are kept under kerosene surface.

.....

8. Equal volumes of different substances have different masses.

.....

- **Give an example of:**

1. A substance which is soft at room temperature. ( )
2. A very active metal. ( )
3. A substance that doesn't conduct electricity. ( )
4. An alloy used in making heating coils. ( )
5. A solid substance has low melting points. ( )

- **What will happen if:**

A piece of is left exposed to humid air for a long period of time.

.....

- **What is meant by ?**

Density.

.....

- **Mention the difference between the following:**

1. Hydrochloric acid solution and a solution of hydrogen chloride in benzene.

.....

2. Sodium and gold (concerning: chemical activity).

.....

- **Problems:**

1. Calculate the density of a piece of copper, if you know that its mass equals 60 gm, and its volume equals 10 cm^3.

2. Calculate the density of a piece of iron, whose mass 208 gm. and its volume 40 cm^3.

3.When a piece of iron of mass 78 gm. is put in a graduated cylinder containing 100 cm^3 of water, the reading of the cylinder becomes 110 cm^3 .Calculate the density of iron.

4. Liquid (A) has a mass of 27gm and a volume of 30 cm^3, while liquid (B) has a mass of 45 gm. and a volume of 40 cm^3.

1. Find the density of each liquid.
2. If you pour the two liquids into the same container, which liquid will be at the bottom? And why?

Unit 1

(Matter and its Construction)

Lesson 2 (Matter Construction)

- **Choose the correct answer.**

1-The volume of a mixture of 300 cm^3 of water and 200 cm^3 of ethyl alcohol is .....500 cm^3.

a. less than

b. more than

c. equals

d. no correct answer

2-.....is the monoatomic liquid molecule.

a. Bromine

b. Mercury

c. Iodine

3-Distance among molecules are very small in .....

a. water.

b. copper.

c. hydrogen.

d. oil.

4-From inert gases is .....

a. nitrogen.

b. helium.

c. oxygen.

5-When the temperature of a liquid is raised, its particles.....

a. escape the attractive forces of the other particles.

b. vibrate more slowly.

c. stop vibrating completely.

6-The molecule of ammonia consists .....atoms.

a.2

b.6

c.4

d.1

- **Complete the following sentences:**

1. The liquid element which is composed of one atom is....., while that is composed of two atoms is .....
2. The matter is composed of small units called....., while these units are consisted of smaller units called .....
3. Ammonia molecule consists of three .....atoms and one .....atom.
4. Gases are characterized by large .....and weak.....

- **Write the scientific term:**

1. The basic classification unit of living organisms. (.....)
2. The smallest part of matter that can exist freely having the properties of matter. (.....)
3. The matter which doesn't take the shape of the container. (.....)
4. The result of combination between two or more different elements with constant weight ratios. (.....)
5. They have definite volumes and indefinite shapes. (.....)
6. The monoatomic liquid element. (.....)
7. The force that binds the molecules of matter together. (.....)
8. The space between molecules. (.....)
9. The simplest pure form of matter which can't be analyzed simpler. (.....)

- **Correct the underlined words :**

1. Ammonia molecule consists of two atoms of hydrogen and one atom of oxygen.
2. Aluminum is from liquid elements.
3. Hydrogen is from inert gases.
4. Bromine is the only liquid metal that its molecule consists of one atom.
5. The molecule of a compound consists of similar atoms.
6. Liquids have fixed shapes.
7. The density equals mass divided area.

- **Put (✓) or (×) :**

1. All inert gases are monoatomic. ( )
2. Motion of molecules is limited in liquids. ( )
3. The hydrogen molecule consists of two hydrogen atoms. ( )
4. The intermolecular forces are very strong in gases. ( )
5. The motion of gases is completely free. ( )

- **Give reason :**

1. The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

.....

2. Oxygen is an element, while water is a compound.

.....

3. It is easy to divide an amount of water into smaller parts.

.....

- **What happens when :**

Adding 100 cm^3 of ethyl alcohol to 400 cm^3 of water.

.....

- **Define:**

Compound.

.....

- **Show by drawing**

The molecules of sodium chloride and ammonia then mention the atoms of the elements forming each one.

- **Mention the difference between the following:**

  Oxygen and helium.

- **Compare between:**

  1. Solids and liquids (regarding to the intermolecular forces among molecules).

  2. Solid and gas (concerning: the motion of the molecules - the attraction forces between molecules).

- **Choose the figure that represents each of the following.**

  a. Hydrogen molecule.
  b. Water molecule.
  c. Helium molecule.
  d. Iron molecule.

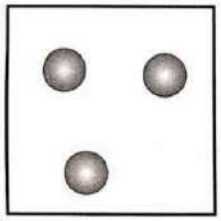


Fig. (A)

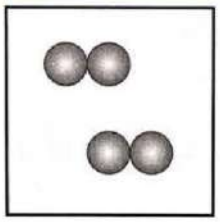


Fig. (B)

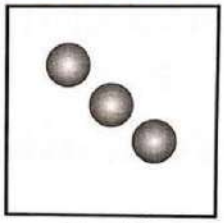


Fig. (C)

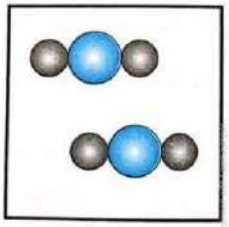


Fig. (D)

Unit 1

(Matter and its Construction)

Lesson 3 (Atomic Structure of Matter)

- **Choose the correct answer.**

1- The atom is electrically .....

a. positive

b. neutral

c. negative

2- The fourth energy level is saturated by.....electrons.

a. 32

b. 18

c. 8

d. 2

3- The electron is .....charged particle.

a. positively

b. negatively

c. neutrally

4- The monoatomic liquid is .....

a. Hg

b. Ag

c. Mg

d. Br

5- The number of electrons that saturates the level (K) is.....

a.8

b.2

c.32

6- Positive charged particles in the nucleus of atom are.....

a. neutrons.

b. protons.

c. electrons.

7- Potassium is symbolized by .....

a. P

b. K

c. B

8- The rule which is used to calculate number of electrons that saturate the first four energy levels is .....

a. 2^2 n

b. $2n^2$

c. 2n

d. n^2

9- When atomic number of an element equals its mass number, this means that there aren't .....in the atom of this element.

a. electrons

b. protons

c. neutrons

d. photons

10-The symbol which represents silver element is.....

a. S

b. Si

c .Au

d. Ag

11-The symbol of copper is .....

a. C

b. Co

c. Cu

12-The outermost energy level of an atom whose atomic number is 12 contains.....electrons.

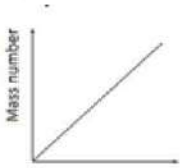
a. 2

b. 8

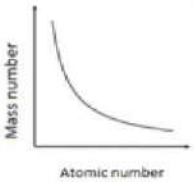
c. 10

d. 12

13-The figure ..... represents the relation between atomic number and mass number.



a.



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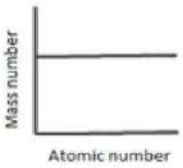


c.

14-Which statement is true about the proton? .....

a. They are positively charged particles outside the nucleus of the atom.

b. The number of neutrons may be less than the number of electrons.

c. The number of protons is less than the number of electrons.

d. As the number of protons changes, the mass of the atom changes and the atom becomes an atom of another element.

15. If the nucleus of the atom contains 11 protons and 12 neutrons, so its mass number is .....

a.11

b.23

c.1

d.12

16. The third energy level is saturated with .....electrons.

a.2

b.10

c.18

d.8

17.The nucleus of .....atom doesn't contain neutrons.

a. neon

b. hydrogen

c. oxygen

d. helium

▪ Complete the following statements:

1. The potential energy of an object depends on.....and.....
2. The atom nucleus contains..... and.....
3. The symbol of potassium atom is ..... , while the symbol of silver atom is.....
4. The electrons have.....charge.
5. Silver symbol is ..... ,whereas sulphur symbol is .....
6. Potassium $_{19}K$ has.....electrons in the outermost energy level, but $_{18}Ar$ has ..... electrons in the outermost energy level .
7. The symbol of the second energy level is .....
8. The electrons revolve around the.....in imaginary regions known as.....

▪ Write the scientific term:

1. The sum of the numbers of protons and neutrons inside the nucleus of the atom. (.....)
2. Amount of energy which an electron loses or gains to transfer from an energy level into another one. (.....)
3. Imaginary places in which electrons can move according to their energies. (.....)
4. The number of positive protons in the nucleus. (.....)
5. Electrically neutral particles are found in the nucleus. (.....)

▪ Correct the underlined words :

1. The electron can transfer to a higher energy level if it <u>loses</u> energy.
2. Carbon is symbolized by <u>Ca.</u>
3. The atom mass is concentrated inside the <u>electrons</u>.
4. The relation ($2n^2$) is not applied to energy level higher than <u>5^{th}</u> level.

▪ Put (✓) or (×) :

1. Mass number is the sum of protons and electrons numbers. ( )
2. Mass number is the number of neutrons in the nucleus. ( )
3. Neutrons are found inside the nucleus and carries positive charges. ( )

4. Neutrons are particles, which are negatively charged of negligible mass and revolve around the nucleus. ( )
5. The third energy level is saturated with 18 electrons. ( )

- **Give reason :**

The atom is electrically neutral.

.....

- **What happens in each of the following cases...?**

1. The nucleus of an atom doesn't contain neutrons.

.....

2. An electron gains a quantum of energy.

.....

- **What is meant by :**

Atomic number.

.....

- **Write the symbols of the following:**

1. Oxygen
2. Copper
3. Iron
4. Hydrogen
5. Sodium
6. Carbon
7. Argon.
8. Calcium
9. Aluminum
10. Mercury
11. Zinc
12. Silver

- **Mention one difference between :**

  The electron and the proton.

- **Cross the odd word :**

  $_{6}C$- $_{10}Ne$- $_{9}F$ - $_{7}N$

An atom of chlorine has 17 electrons and 18 neutrons

1. Use these numbers to calculate (a) and (b), then write its symbol correctly as (${}^{b}_{a}X$).

2. What does each of the letters (a) and (b) refer to?

Write the electronic configuration of the following atom:

$^{23}_{11}Na$, $^{7}_{3}Li$, $^{40}_{18}Ar$, $^{20}_{10}He$

$_{7}N$, $_{17}Cl$, $_{20}Ca$, $_{10}Ne$

Unit 2 (Energy)

Lesson 1 (Energy; Resources and Forms)

Choose the correct answer.

1- The produced energy by burning the fuel is .....energy.

a. potential

b. nuclear

c. heat

2- An object of weight 6 newton, moved to a height 5 m, its potential energy is.....joules.

a. 30

b. 75

c. 11

3- The Sun is a.....source of energy.

a. non-renewable

b. renewable

c. permanent

d. all the previous

4-An object of mass I kg moves at speed 4 m/s., so it has a kinetic energy =.....joule.

a. 16

b. 8

c. 64

d. 4

5-..... is a renewable source of energy.

a. coal

b. petrol

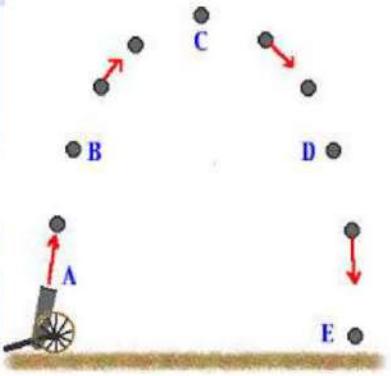
c. wind

d. natural gas

6- As doubling height to which an object is raised from ground, so the .....
a. kinetic energy is increased to its double value.
b. potential energy is increased to 3 times.
c. potential energy is increased to its double value.
d. mechanical energy is increased to 4 times.

7- As an object launched upwards, ...
a. its speed decreases.
b. its speed increases.
c. its kinetic energy increases gradually.
d. its potential energy decreases gradually.

8-In the shown figure:
i)The maximum value of the potential energy is at position .....
a. (A)
b. (B)
c. (C)
d. (D)
ii)The mechanical energy is equal to .....
a. Kinetic energy at (A) + potential energy at (B)
b. Kinetic energy at (A) + potential energy at (C)
c. Kinetic energy at (B) + potential energy at (E)
d. Kinetic energy at (D) + potential energy at (D)



9- Chemical energy is stored in .....
a. stretched spring
b. car battery
c. car lamps
d. pendulum.

10-In the simple pendulum, the potential energy at the maximum height = ...
a. kinetic energy
b. zero
c. mechanical energy
d. 10 joules.

Complete the following statements:

1. Energy is the ability to do ....., and its measuring unit is .....
2. The energy stored in the food is ....., energy, while.....energy is produced from the dry cell.
3. When an object is launched upwards. its speed .....
4. When a body raised up, the potential energy ....., while the kinetic energy .....
5. An object of mass 2 kg is moving at a speed of 4 m/s has a kinetic energy .....
6. The potential energy of an object depends on ..... and .....
7. Potential energy = ... x .....
8. If you bounce a basketball on the ground, its speed .....as it comes closer to the ground, and it .....energy decreases.

Write the scientific term:

1. Energy stored in the object due to the work done on the object. ( )
2. It is the work done during the motion of an object. ( )

Correct the underlined words :

1. Resource of permanent energy is <u>nuclear</u> energy.
2. Measuring unit of weight is <u>joule</u>.
3. <u>The chemical</u> energy of the object is equal to the sum of the potential and kinetic energies.
4. Wind is a <u>non-renewable</u> source of energy.

Put (✓) or (×) :

1. Fuel in a car as food for a man. ( )
2. The measuring unit of potential energy is the joule. ( )
3. The kinetic energy of a static object equals zero. ( )
4. Potential energy of an object decreases by increasing its height. ( )
5. Weight = Mass + Acceleration due to gravity.

Write the mathematical rule used to find: (mention the units)

1. Work done to move an object from one point to another.

2. Weight.

- **What happens when :**

1. The height of an object is doubled (concerning its potential energy).

.....

2. Doubling the weight of an object (concerning its potential energy).

.....

- **What is meant by .....?**

1. Kinetic energy.

.....

2. Potential energy.

.....

- **Problems:**

1. Find the weight of an object of potential energy 88 joules when it is found at a height of 11m.

2. A car of mass 50 kg is moving with a speed 5m/s. Calculate its kinetic energy.

3. Calculate the potential energy of an object its weight is 20 N. and placed at 2m. height from the ground.

4. A ball of mass 0.5 kg was launched upwards at a speed 3 m/sec. to a height 4m.
Calculate its potential energy and kinetic energy.(knowing that the acceleration due to gravity = $10 m/sec^2$.)

5. A ball was thrown vertically upwards at a speed 5 m/sec. to a height 10 m. what is the work done on the ball if its weight is 7 newton and has a mass of 0.5 kg?

Unit 2 (Energy)

Lesson 2 (Energy Transformation)

Choose the correct answer.

1- In car engine the chemical energy is changed into.....energy.
a. magnetic
b. electric
c. mechanical

2- The electric energy is converted into kinetic energy in .....
a. electric lamp.
b. electric fan.
c. electric heater.

3- Dynamo converts mechanical energy into.....energy.
a. electric
b. nuclear
c. solar

4- The solar heater changes solar energy into.....energy.
a. chemical
b. electric
c. kinetic
d. heat

5- The electric energy is converted into kinetic energy in .....
a. electric lamp.
b. cellular phone.
c. electric fan.

6- On doubling the height the potential energy is.....
a. constant.
b. doubled.
c. increased four times.

Complete the following statements.

1- In the simple cell, ...energy changes into.....energy.

2- The simple cell consists of.....solution and two different metals.

3- Electric energy is converted into kinetic energy in .....

4- The electric circuit contains..... to produce electric energy and ..... to use this electric energy.

5- In the dynamo, ...energy changes into ..... energy.

6- If the potential energy of an object is 100 joules and its kinetic energy is 50 joules, its mechanical energy is .....

7- Energy is neither .....or....., but it can be converted from one form to another.

8- The two metals in the simple electric cell are .....and .....

9- The simple electric cell, the positive pole is ....., while the negative pole is .....

▪ Write the scientific term:

1. The sum of potential and kinetic energies of a body. (.....)
2. Energy is neither created nor destroyed but can be transformed into another form. (.....)
3. Pollution produced from the web of cellular phone. (.....)

▪ Put (✓) or (×) :

1. The positive pole in a simple cell is lead. ( )
2. When the ball of pendulum goes away from its original position, its kinetic energy increases. ( )
3. Chemical energy can be stored in stretched spring. ( )
4. In the car dynamo electric energy is changed into kinetic energy. ( )
5. In the electric cell, the electric energy is converted into chemical energy. ( )

▪ Correct the underlined words :

1. In simple cell the positive pole is a rode of <u>zinc</u>.
2. The electric fan produces <u>heat energy.</u>
3. Solar batteries change <u>mechanical</u> energy into mechanical energy.

What happens in the following case...?

Overuse of chemical pesticides.

.....

Mention:

Two technological applications, then mention the energy transformation in each one.

.....

.....

Show by a complete labeled drawing the structure of the simple electric cell and mention the idea of its operation.

Unit 2 (Energy)

Lesson 3 (Heat Energy)

Choose the correct answer.

1- When air heats up its density .....

a. does not change

b. increases

c. decreases.

d. (b) and (c).

2- By increasing the kinetic energy of particles, their.....increases.

a. weight

b. temperature

c. volume

3- In the solar cell, the solar energy is converted into.....energy.

a. kinetic

b. light

c. electric

d .heat

4- Heat is transferred by radiation through .....

a. liquids only.

b. gases only.

c. material media and non-material ones.

5- Energy is neither created nor destroyed, but it can be transformed into another form of energy. this law is known as law of .....

a. conservation of energy.

b. conservation of matter.

c. kinetic energy.

d. Earth's gravity.

6- Heat transfers from a heater by .....

a. conduction and radiation

b. radiation and convection

c. conduction and convection

d. radiation only.

- **complete:**

1. Electric stove turns .....energy into.....energy.
2. In the solar heater, ... energy changes into .....energy.
3. Heat transfers through solids by....., while through liquids by.....
4. In the photosynthesis process, ... energy changes into ..... energy.

- **Write the scientific term:**

1. It is a form of energy which transfers from a higher temperature object to a lower temperature object. (.....)
2. The transfer of heat from hot object to another without any need for a material medium through which heat transfers. (.....)
3. It is the heat condition which determines whether heat transfers from or to an object when it comes in contact with another. (.....)
4. A method of transferring heat through solids. (.....)
5. The way by which the heat is transferred through gases and space. (.....)

- **Correct the underlined words :**

1. Friction turns potential energy into heat energy.
2. In solar cell the solar energy is changed into magnetic one.
3. Heat transferred through liquids by radiation.
4. The networks of cellular phones cause noise pollution.
5. Friction produces light energy.

- **Put (✓) or (×) :**

1. Heat transferred through solids by conduction. ( )
2. Friction turns mechanical energy to electric energy. ( )
3. The transfer of heat through copper is by conduction. ( )
4. Temperature is directly proportional to the kinetic energy of the particles. ( )
5. Convection is a way, which the heat is transferred through gases and space. ( )
6. Heat is transferred through gases by convection only. ( )
7. Cold air rises up, but hot air falls down. ( )

- **Give reason :**

1. The freezer is found at the top of the fridge.

.....

2. The heater is placed on the ground.

.....

3. The heat of the sun is transferred to the Earth by radiation.

.....

4. A solar heater is preferred than a gas heater.

.....

- **What happens when :**

1. Rubbing your hands together.

.....

2. Friction occurs between the frame of the bicycle wheel and brakes.

.....

- **Compare between:**

An electric heater and coal heater (concerning; the effect on the environment, the resource of energy and its kind).

Unit 3

(Diversity and Adaptation in Living Organisms)

Lesson 1 (Living Organisms Diversity and Principles of their Classification)

Choose the correct answer.

1-.....are from animals that have an external support.

a. Mammals

b. Snails

c. Birds

2-.....reproduces by spores.

a. Vougheir

b. pine

c. bean

3- The number of pairs of scorpion legs are .....

a. 4

b. 3

c. 44

4- .....is an example of plants that reproduce by seeds.

a. Adiantum

b. Vougheir

c. Bean

5- .....belongs to animals that has no body support.

a. Mussel

b. Hedgehog

c. Octopus

d. Snake

6- Secretion of poison in some snakes is an example of.....adaptation.

a. structural

b. behavioral

c. functional

d. all of them

7-.....is an animal that have no body support .

a. Earthworm

b. Snake

c. Hedgehog

d. no correct answer

8- .....reproduces by spores.

a. Adiantum

b. Pine

c. Bean

d. Wheat

9- From gymnosperms plants: .....

a. wheat.

b. pine plant.

c. maize.

10- From gymnosperms plants is .....

a. wheat.

b. Vougheir.

c. cycas.

d. pea.

11-The scorpion belongs to .....

a. insect.

b. myriapods.

c. arachnids.

d. mammals.

12- .....are from the animals which don't have a body support.
a . Reptiles
b. Snails
c. Jellyfishes
d. Birds

13- Pea plant belongs to .....plants.
a. fem
b. monocotyledon
c. dicotyledon
d. gymnosperm

14- An example of animals with internal support is .....
a . octopus.
b. snail.
c. shark.

16-.....is from teethless mammals.
a. Armadillo
b. Rabbit
c. Rat
d. Lion

- **Complete the following statements:**

1. An animal which has no body support such as.....
2. Plants reproduce by formation of seeds divided into ..... and .....
3. .....has an internal support, while.....has an external support.
4. The number of jerboa's upper jaw incisors equals.....and the number of the rabbit's upper jaw incisors equals .....
5. Scolopendra belongs to ..... , whereas spider belongs to .....
6. ..... and.....are teeth less mammals.
7. Insects have.....pairs of jointed legs
8. Plants may carry large-sized leaves such as.....and some has small-sized leaves such as .....

9. Arthropods are classified according to the number of ..... into three groups called ....., ..., and .....
10. Plants reproduce by formation of ..... or .....
11. .....and..... are examples of micro-organisms that live in water.
12. The cockroach belongs to ....., whereas the scorpion belongs to .....although both of them are arthropods.

▪ Write the scientific term:

1. Plants that can't be distinguished into roots, stems and leaves. (.....)
2. A group of similar living organisms in shape that can reproduce to give birth of new fertile individuals. (.....)
3. The basic classification unit for living organisms. (.....)
4. A group of animals that have three pairs of jointed legs. (.....)
5. They are invertebrate animals which have numerous number of legs. (.....)

▪ Put (✓) or (×) :

1. Bean plant is a dicotyledon plant. ( )
2. Taxonomy is a branch of biology that searches for the similarities and differences among living organisms. ( )
3. Euglena from multicellular living organisms. ( )
4. Angiosperms are called flowering plants. ( )
5. Maize plant is considered from dicotyledon plants. ( )
6. Flies have six legs. ( )

▪ Correct the underlined words :

1. Locust belongs to arachnids.
2. Whale is a unicellular organism.
3. Rat is considered from teethless mammals.
4. Animals with external support are such as reptiles.

▪ Cross the odd word:

1. Spiders - Locusts - Flies - Cockroaches.
2. Locust - Mosquito - Spider - Cockroach - Flies.
3. Lion - Tiger - Dog - Wolf - Armadillo.

4. Mosquito - Spider - Cockroach -Ant.
5. Snake - Jellyfish - Shark - Frog.
6. Reptiles - Fishes - Birds - Worms.

- **Give an example of:**

1. A dicotyledon plant.
2. A plant have large leaves.
3. Plants reproduce by formation of spores.
4. A rodent.
5. A teethless animal.
6. An animal with external support.

- **Give reason :**

1. The front teeth of hedgehog are extending outwards.

.....

2. Amoeba is from micro- organisms.

.....

3. Spiders are not belong to insects.

.....

- **Mention the difference between the following:**

1. Insects and arachnids (according to: the number of legs).

.....

.....

2. Fish and desert snail (body support).

.....

.....

3. The teeth of a rat and the teeth of a tiger.

.....

.....

Unit 3

(Diversity and Adaptation in Living Organisms)

Lesson 2 (Adaptation and Diversity Living Organisms)

Choose the correct answer.

1- Secretion of poison in snakes is a .....adaptation.

a. structural

b. functional

c. behavioural

2- .....is a bird migrates in winter.

a. Quail

b. Duck

c. Sparrow

3- Birds migration represents.....adaptation.

a. anatomical

b. functional

c. structural

d. behavioral

4- Insectivorous plants cannot absorb the nitrogenous substances to make.....

a. carbohydrates.

b. proteins.

c. fats.

d. vitamins.

5- The shown leg belongs to a (an).....

a. duck

b. heron

c. hawk

6-All of the following show structural adaptation except .....
a. leaf insect
b. chameleon
c. stick insect
d. drosera

7- Camel is an example of
a. structural adaptation
b. behavioural adaptation
c. functional adaptation
d. all of the previous types of adaptation.

8- From the examples of living organisms that undergo aestivation is .....
a. desert snail
b. heron
c. hawk
d. no correct answer

9- From the examples of living organisms that undergo hibernation is .....
a. desert snail
b. jerboa
c. frog
d. all of the previous.

10- Secreting of sweat is considered .....
a. structural adaptation
b. behavioural adaptation
c. functional adaptation
d. all of the previous types of adaptation.

Complete the following statements.

1. The dolphins front limbs are modified into .....to perform the role of .....
2. Hawks have ..... beaks to tear the prey, whereas ducks have.....beaks to filter food from water.
3. The whale front limbs are modified into .....

4. Herons have ..... beaks to tear the prey, and .....legs ending in thin fingers to ..... in water.
5. Birds migration is.....adaptation.
6. .....and.....are examples of insectivorous plants.

▪ Write the scientific term:

1. The type of adaptation when birds migrate from one place to another. (.....)
2. The ability of some living organisms to simulate the dominant environmental conditions to be hidden from their enemies. (.....)
3. A modification in behavior, structure of function of a living organism to become more adapted with environment. (.....)
4. The behaviour through which some animals dormant and stop most of their vital activities to avoid the extreme rise in temperature and shortage of food. (.....)
5. The ability of some living organisms to be hidden from their enemies or to capture the preys in the predatory species. (.....)

▪ Put (✓) or (×) :

1. Insectivorous plants get the nitrogenous substances through photosynthesis. ( )
2. The birds activity during the daylight is considered a functional adaptation. ( )
3. Aestivation is the behavior that some animals do by hiding in burrows to avoid low temperature in winter. ( )
4. Ducks and geese have palm legs to help them in swimming. ( )
5. Frog hibernate in summer by hiding in burrows. ( )

▪ Correct the underlined words :

1. The camel's limbs end with strong hoofs.
2. Secreting poison in snakes is considered as a behavioral adaptation.
3. Insectivorous plants catch and pounce insects to get starch.
4. Bean is an example of insectivorous plants.

▪ Give reason:

1. Some plants are predators although they are self-feeding.

.....

2. Some plants pounce insects.

.....

3. Some desert animals tend to aestivation.

.....

4. Heron bird has long and thin beak.

.....

5. Camel limbs end in a thick flat pad.

.....

- **Cross the word out :**

1. Dieonea - Drosera -Amoeba - Halophila.
2. Whale - Bat - Dolphin - Sea lion.

- **Mention one use or function of each of the following:**

1. Palm legs in geese.

2. Long arms and fingers in monkey.

- **What is meant by:**

Hibernation:

.....

- **Compare between:**

1. Hibernation and aestivation.

2. Predatory birds and water birds (concerning: the modification of beaks and legs- examples).

An example showing the adaptation of the following living organisms:

1. Hedgehog

2. Duck

WORKSHEET 1 (UNIT 1)

A) Complete:

1. Matter is anything that has ----------&----------

2. It is possible to distinguish between perfume& vinegar by their

   ----

3. The measuring unit of mass is ----------,while ---------- is the measuring unit of the volume.

4. It is possible to distinguish between table salt& sugar by their ----------

5. The density is the --------- of unit volume& its measuring unit is ----------

6. ----------& ---------float on the water as they have -------- density than that of water, while ----------, ---------- sink in water.

B) On determining iron density using a piece of iron of mass 87g. The piece is immersed in 100 cm^3 of water, the water increases up to 110 cm^3. Calculate the density of iron.

_____

_____

C) Write the scientific term:

1. Any thing that has mass& volume. ----------
2. The measuring unit of the density. ----------
3. The mass of unit volume of a substance. ----------

D) Give reasons:

1. A piece of wood floats on the water surface, while a piece of iron sinks.

_____

2. Equal masses of different substances have different volumes.

_____

WORKSHEET 2 (UNIT 1)

A) Write the scientific term:

1. A substance which can't be softening if heated.
---

2. Substances need heat to be softened& to be easily shaped.
---

3. The temperature at which the substance changes from liquid state to gaseous state. ---

4. An alloy used in the manufacture of heating elements of heaters. ---

5. 4. An alloy used in the manufacture of Gold jewelry.
---

6. The temperature at which the substance changes from solid state to liquid state. ---

7. Substances that allow electricity to pass through them.
---

8. Metals which don't react with atmospheric oxygen. .
---

9. A solid substance that appears solid at room temperature.

B) Give reasons: ---

1. We can distinguish between gold& silver.
---

2. Balloons of hydrogen& Helium rise up in the air.
---

3. Petrol fires are not put out by water.
---

4. Equal volumes of different substances have different masses.

C)Calculate the density of a piece of iron if its mass is 87 gm.& when you put it in a graduated cylinder has 100 cm^3 water, the volume of water raised to 110 cm^3.

D) How can you differentiate between:

1. Vinegar& Perfumes

2. Iron& wood.

3. Milk& honey.

WORKSHEET 3 (UNIT 1)

Complete the following:

1. ---------- take the shape of the container, while ---------- don't have definite shape.
2. ---------- is the smallest particle of a matter which can be existed freely& it has its own matter properties.

3. There are ----------& ---------- between the molecules of matter.

4. Matter consists of small building unit called ----------, Which consist of smaller building units called----------

What happens when& why?

1. You open a bottle of perfume& put it in a corner of the room.

---

2. You add 200 $cm^3$of ethyl alcohol to 300 cm^3 of water in a measuring cylinder.

Compare between:

	Solid	Liquid	Gas
Motion of molecules			
Intermolecular space			
Intermolecular force			

Give reasons:

1. Gases have indefinite shapes& volumes.
---
2. Heat changes the matter from the solid state to liquid state.

WORKSHEET 4 (UNIT 1)

Q1 Write the scientific term:

1. The simplest pure form of a substance, we couldn't decompose it into simple substance. _____

2. A substance which its molecule consists of different atoms. _____

3. The molecule which consists of one nitrogen atom& 3hydrogen atoms. _____

4. The Molecules of gaseous elements which are composed of one atom. _____

5. The molecule of a liquid element which consists of two atoms. _____

Q2 Complete:

1. The molecule of water consists of two----------.atoms& one----------atom.

2. The molecule of table salt consists of one ----------atom& one ---------- atom

3. The molecule of ammonia consists of one ----------atom& three ----------atoms.

4. All the molecules of ---------- are composed of one atom.

5. The liquid molecule which consists of one atom only is ----------

6. The inert gases are ----------, ----------, ----------,

   ----------, ----------, ----------

WORKSHEET 5 (UNIT 1)

Q1 Write the scientific term:

1. The central core of the atom where its mass& positive charges are concentrated. ----------
2. The number of the positive charged particles (protons) in the nucleus. ----------
3. The sum of protons& neutrons number found in the nucleus. ----------
4. The imaginary places around the nucleus in which the electrons move according to their energy. ----------
5. The amount of energy gained or lost by the electron when it transfers from one energy level to another. ----------

Q2 Write the symbols of:

Aluminum _____ Sodium _____ Lithum _____ Iron____
Magnesium ____ Chlorine _____ Oxygen ____Copper ____

Q3Complete:

1. The nucleus includes the positive charged particles known as ---------- & neutral particles known as ----------
2. The number of neutrons = ------- number _ ------numbers
3. The ---------- are negatively charged particles of negligible mass.
4. The electrons revolve around the nucleus in ---------- known as ----------
5. The 1st energy level K is saturated by ----- electrons, while the outer most energy level is saturated by------ electrons.

Q4 Give reasons:

1. The atom is electrically neutral.

_____

_____

2. The mass number is greater than the atomic number.

_____

WORKSHEET 6 (UNIT 1)

Q1 Write the electronic configuration of the following:

$_{11}Na$

$_{17}Cl$

$_{2}He$

$_{12}Mg$

$_{3}Li$

$_{6}C$

$_{20}Ca$

$_{10}Ne$

$_{13}Al$

Q4 Give reasons:

1. Neon atom ($_{10}Ne$) does not enter a chemical reaction through the ordinary conditions.

_____

_____

2. The electrons are distributed to fill the K level before filling the L level.

_____

_____

3. The equation ($2n^2$) is not applied on levels higher than 4^{th} level.

_____

_____

4. The 3^{rd} energy level M in the atom contains 18 electrons.

_____

_____

General revision on unit 1

Q1. Complete:

The element	Electronic configuration	Mass number	Atomic number	No. of neutrons
$^{27}_{13}Al$				
$^{20}_{10}Ne$				
$^{7}_{3}Li$				
$^{32}_{16}S$				
$^{12}_{6}C$				

Q2. Write down the formula (rule) by which you can find each of the following:

1. Density: _____
2. Number of electrons saturates the energy level of an atom: ----------

_____

Q3 Choose from column (B) the suitable answer from column (A):

Column (A)	Column (B)
1. Density measuring unit	a. Gram
2. Volume measuring unit	b. cm^3
3. Mass measuring unit	c. gm/ cm^3
4. Number of positive protons in the nucleus	d. mass number
5. Total number of protons& Neutrons	e. atomic number
6. Bad conductors of heat& electricity	f. copper& iron
7. Good conductors of heat& electricity	g. wood& plastic.

Q. Give reasons:

1. Inert gases can not share in chemical reactions in ordinary states. _____
2. It is difficult to bend an iron rod.

_____

3. Some table salts disappear after a while when added to water without stirring.

_____

WORKSHEET 1 (UNIT 2)

Q1 Write the scientific term:

1. The ability to do work or exerting a change.

_____

2. The energy stored in the object due to a work done on it.

_____

3. The work done during the motion of an object.

_____

4. The sum of the potential& kinetic energy.

_____

5. The resource of permanent energy.

_____

Q2. Complete:

1. From the energy forms are ----------, ----------
   ----------& ----------

2. Potential energy = ---------- x ----------

3. Kinetic energy = ½ x ---------- x ----------

4. Mechanical energy = ---------- + ----------

Q3(A) Calculate the potential energy of an object of 20 N weight is placed at 5 m height .

_____

_____

(B) Calculate the kinetic energy of an object of mass 2 Kg is moving at a speed of 4 m/ Sec.

_____

_____

WORKSHEET 2 (UNIT 2)

Q1 Complete:

1. The sum of the potential energy& kinetic energy at any moment is ----------

2. In the electric cell ---------- energy is converted into ------ Energy.

3. Technology has negative effects when man used it in ------- & ----------

4. In electric lamp ---------- energy is converted into ---- energy.

5. The sum of the potential energy& kinetic energy under the effect of gravity is constant, this law is known as ----------

6. In solar batteries, solar energy is directly converted into ---- ----energy.

7. In the pendulum& children swing are examples of the interchange between ----------& ---------- energy without ending.

Q2 Write the scientific term:

1. The sum of the potential energy& kinetic energy under the effect of gravity is constant. ----------
2. Energy is neither created nor destroyed but it is converted from one form into another. ----------

Q3 Mention some of energy changes in cars:

_____

_____

Q4 Complete:

The electric cell is composed of

It changes ----------

WORKSHEET 3 (UNIT 2)

Q1 Complete:

1. Heat transfers from -------- temperature objects to ------- temperature objects.

2. Friction turns ---------- energy to ----------energy

3. The methods of heat transfer are ----------
----, ----------& ----------

4. From the technological applications to produce heat are ----,
----------& ----------
5. Heat transfers in ----------& ---------- by convection.

Q2 Write the scientific term:

1. The condition which states the direction of heat energy weather from or to the object when it comes in contact with another.

----

2. A form of energy which transfers from higher temperature to a lower one. ----------

3. The way of heat transfer in gases& space without any need of material medium. ----------

4. The way of heat transfer in solids from the hot end to the cold one. ----------

Q3Give reasons:

1. The freezer is found at the top of the fridge.

_____

_____

2. The electric heater is placed down on the ground.

_____

3. When you rub your hands together, you fell hot.

_____

General revision on unit 2

Q1. Complete:

1. In the filament of the electric lamp the ---------- energy is converted into ---------- energy.

2. Heat is transferred through solids by ----------

3. Mechanical energy is converted into heat energy by ---------

4. Heat transfers from a heater by ----------& ----------

5. In ----------, there is an energy transformation from potential energy into kinetic one& vice versa.

6. When car lamps& radio cassette are on, the change inside the car battery from ---------- energy into ---------- energy.

Q2 What is meant by:

1. Potential energy:

_____

_____

2. Mechanical energy:

_____

_____

Q3 Give reasons:

1. Fuel in a car is as food for man.

_____

_____

2. Nuclear stations which produce electricity are preferred to those of petrol stations.

_____

3. Ecologist does not appreciate all the technological applications which used in energy transformations.

_____

WORKSHEET 1 (UNIT 3)

Q1. Complete:

1. Animals differ in ----------, ----------&----------
2. Huge trees such as ----------& ----------while
   Short weeds such as ----------& ----------

3. Plants carry large-sized leaves such as ----------plants while plants carry small-sized leaves such as----------

4. Unicellular micro-organisms such as, ----------, ----------& ----------
5. Due to the enormous diversity of living organisms, scientists classify them to ----------

6. Some plants can't be distinguished into roots, stems& leaves such as ----------

7. We can classify plants according to ----------& ----------
8. ---------- is an example for plants that reproduce by spores.

9. Maize& wheat are from the ---------- flowering plant, While beans& peas are from ----------

10. Some seeds are formed inside cones such as ----------& -------
11. ----------, ----------& ----------are from animals which don't have a body support.

12. ----------& ---------- have external body support, while Fish, birds& man have ---------- body support.

13. Arthropods can be classified according to the number of legs into insects, ----------& ----------

Q2 Mention an example of:

Arthropods with 3 pairs of jointed legs: ----------
Arthropods with 4 pairs of jointed legs: ----------
Arthropods with large number of jointed legs: ----------

WORKSHEET 2 LESSON 1 (UNIT 3)

Q1. Complete:

1. ----------& ---------- are teeth less mammals.

2. Mammals which have pointed canines& molars with sharp projections such as ----------& ----------

3. Rodents have one pair of incisors in each jaw such as ----------& ----------, while ---------- have two pairs of incisors as rabbits.

4. Hedgehogs have front teeth extending outwards to ----------

Q2 Write the scientific terms:

1. The branch of biology searching the similarities& the differences among living organisms, and placing the similar ones in group.

---

2. The basic classification unit for living organisms.

---

3 The barren female which is produced from mating of a donkey& a horse. ----------

4. A group of more similar living organism's shape that can reproduce to give birth of new fertile individuals that is able to reproduce.

---

5. A teeth less (Edentates) mammal. ----------

Q3 Give reasons

1. Hedgehogs have front teeth extending outwards

_____

2. When a zebra mates a donkey, they can't produce fertile individuals.

_____

Q4. State a difference between:

1. Bean plant& wheat plant.

---

2. A rabbit& squirrel.

WORKSHEET 3 LESSON 2 (UNIT 3)

Q1 Complete:

1. Horses limbs end in ---------- to run over rocky soil, whereas camel limbs end in ---------- to walk on hot sandy soil.

2. Bird migration is a ---------- adaptation, while secreting poison in snakes is a ---------- adaptation.

3. The reasons of adaptation are ----------
--&
---

4. The whale front limbs are modified into ---------- to perform ---------- , whereas they modified in bats into --------- to perform ----------

5. Hawks have ---------- beaks to tear the prey, while ducks have beaks to filter food from water.

6. ----------& ----------are examples for insectivorous

Q2 Write the scientific term:

1. A modification in a living organism or its body structure or even the biological function of its organs. ----------
2. Self feeding green plants that can perform photosynthesis process & make carbohydrates. ----------

Q3 Give reasons:

1. Some birds have long& thin beaks& their long legs end in thin toes.

_____

2. Some plants pounce insects.

_____

3. The camel pad ends in a thick flat one while horse hoof ends in a strong solid end

_____

WORKSHEET 4 LESSON 3 (UNIT 3)

Q1 Complete:

1. The living organisms that undergoes hibernation is the ----------

2. Leaves are reduced into spines in ---------- plant.

3. There are air chambers in the leaves of ---------- plant.

4. Some animals undergo aestivation such as ----------& ----------

5. Water is stored in the leaves ---------- plant.

6. Some species of birds are adapted to the environmental conditions By Migration such as ----------

7. Some animals can color themselves with the dominant colours in the environment such as ----------, ----------& ----------

Q2 Write the scientific terms:

1. Is the ability of some living organisms to be hidden from their enemies or to capture the preys in the predator species. ----------

2. Some animals hide in burrows in winter or bury themselves in mud, stop feeding& their activities are decreased. ----------

3. Some animals in summer become in a dormant state& hide in humid burrows. ----------

4. The ship of desert. ----------

Q3 Give reasons:

1. Some animals undergo hibernation.

_____

2. Some species of birds migrate from their original habitats in winter.

_____

3. The presence of air chambers in elodea stem.

_____

WORKSHEET 5 LESSON 3 (UNIT 3)

Q1 Give an example of each:

1. Camouflage in insects.
2. Hibernation in amphibians.
3. Aestivation in rodents.
4. A totally submerged aquatic plant.
5. A desert plant that its leaves are modified into spines.
6. A desert plant that its leaves are modified into juicy branches.

Q2 Mention five features of adaptation in the camel.

1. ----------
2. ----------
3. ----------
4. ----------
5. ----------

Q3 Give reasons:

1. Camel's fur is distributed at different densities on its body regions.

_____

2. Camel's ear is small& covered with dense hair from inside

_____

3. The camel stores an amount of fats in its hump.

_____

4. The Camel has a plenty number of lachrymal glands&2 rows of long eye lashes.

_____

5. The forked upper lip camel's mouth& the strong enamel of its teeth.

_____

6. The camel's legs end in a broad pad.

_____

General Exercises on unit 3

Q1 Complete:

1. Armadillo belongs to ---------- mammals, while the hedgehog belongs to ---------- mammals.

2. ----------& ---------- are examples of micro-organisms that live in water.

3. ---------- is from the plants that reproduce by formation of spores,
while ---------- is from the plants that produce seeds inside cones.

4. The number of jerboa's upper jaw incisors is ----------&their number in the rabbit's upper jaw is ----------

5. Camel's blood temperature changes from -------- C in early morning into -------- C during day light hours.

Q2 Give an example to show the adaptation of the following:

1. Duck. _____
2. Heron. _____
3. Hedgehog. _____
4. Dionea plant. _____

Q3. Give one difference between:

1. Bean plant& Maize plant.

_____

2. Insects& Arachnids.

_____

3. Rodents& Lagomorphs.

_____

Q4 Choose the correct answer:

1. Camel can survive without drinking water for ----------
(3 days – 3 weeks - 3 months - a week or more)

2. ---------- belongs to the animals with no body support.
(Octopus - Mussel - Hedgehog - Snake)
3. ---------- is from the rodent that undergo aestivation.
(Rat - Squirrel - Jerboe - Desert snail)

Unit 1 – Lesson 1 – Part 1

Matter and its characteristics

Complete

1- Matter is anything that has ……mass……and……volume……

2- You can distinguish between gold and silver by their different……color……

3- You can differentiate between table salt and sugar by their different……taste……

4-The mass of one cubic centimeter of matter is known as ……density……

5-……iron….and…copper……sink in water as they have density……bigger……than water

Choose the correct answer

1- The smell property is a distinguishing factor between
   a) Iron and copper
   b) Wood and plastic
   c) Vinegar and perfume
   d) Silver and iron

2- The density of substance is ……property
   a) Chemical
   b) Physical
   c) Biological
   d) a and b

3- Equal masses of different substances have ……volume
   a) Similar
   b) Different
   c) Constant
   d) equal

4-…… is from the substances that float on water surface

a) Iron
b) Cork
c) Copper

Unit 1 – Lesson 1 – Part 2

Matter and its characteristics

A-Complete:

1- An alloy of …gold and copper Is used in making jewels while an alloy of Nickel and Chrome is used in making heaters coils .

2-Some solutions are good conductor of electricity such as …acidic…, alkaline……and ……salt solutions

while some solutions which do not conduct electricity like sugary solutions

3- Bridges are made up of iron and coated in the purposes of protecting them From rusting

4- Electric wires are made up of ……copper…….or ……aluminum…….

B -Give reasons for:

1- Cooking pots are made up of Aluminum where their hand grip are made up or wood or plastic

as aluminum is a heat conductor and has a high melting point ,while wood and plastic are heat insulators

2-Potassium and sodium are kept under kerosene surface

to prevent their reaction with atmospheric oxygen .

C-Write the scientific term:

2. The temperature at which a substance changes from solid state into liquid state.

[……..melting point……]

3. The temperature at which a substance changes from a liquid state into gaseous state.

[…….boiling point……..]

D-Classify the following substance according to the chemical activity:

Sodium- Gold - iron- potassium

Potassium

Sodium

Iron

gold

E- Compare between:

Molecules	Solid state	Liquid state	Gaseous state
Motion	Vibrate **Limited**	Slide past each other **Free**	Fast, randomly **Completely Free**
Intermolecular spaces:	Very narrow	Far	Very far
Intermolecular forces:	Strong	Weak	Very weak
Volume:	Definite	Definite	Indefinite
Shape:	Definite	Indefinite	Indefinite

Unit 1 – Lesson 2 – Part 1

Matter construction

What are the properties of molecules?

Properties of the molecules of matter:

1. Molecules keep the properties of matter
2. Molecules are in a state of continuous motion in all directions
3. There are spaces between the molecules of matter
4. There are forces between the molecules of matter

Write the scientific term:

1. The smallest part in matter that can exist freely having the properties of matter . [.....molecules.....]

A Type of matter keeps its shape & volume whatever the container's shape changed. [.....solid.....]

Give reason for:

1- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

As the molecules of the alcohol fill the intermolecular spaces of the water

2- It is different to break down a piece of iron with your hand .

Because Iron has very strong intermolecular forces.

3- The color of water change on adding an amount of potassium permanganate to it .

Because the potassium permanganate molecules have a continuous motion in all direction

4- The Solid changes to liquid by heating.

Because the energy of molecules increases so they move faster, and the spaces increase then changes into liquid

Unit 1- Lesson 3 – part 1

Atomic structure of matter

A- Complete

1. The Latin name of sodium is …Natrium…….and its symbol is ……Na……..
2. The charge of protons is ……positive……..and they present inside the ……nucleus…..

3- The mass of the atom is concentrated in …… nucleus ……..

4- The charge of the electrons (e) is ……negative…….……while the charge of atom is……..……neutral…..

5. The Latin name of Potassium is …kalium….and its symbol is ……..K…..
6. The Latin name of iron is ……Ferrum…… and its symbol is ……Fe……..

B-Write the scientific term:

Imaginary places around the nucleus in which electrons moves according to their energy. [……. energy levels……..]

2- Negatively charged particles revolve around the nucleus.
[……..nucleus ……..]

C-Give reason

The atom is electrically neutral.

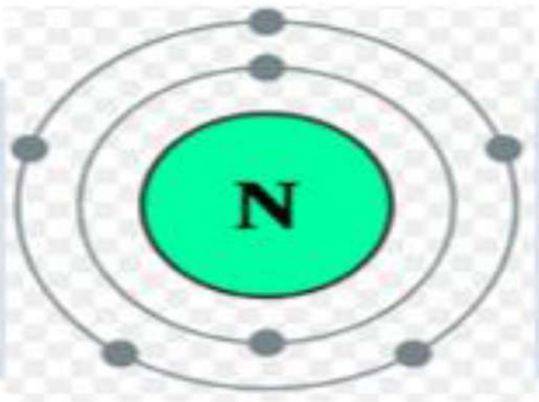
Because: number of (+) protons =number of(-)electrons

D-Write the name of the element:-

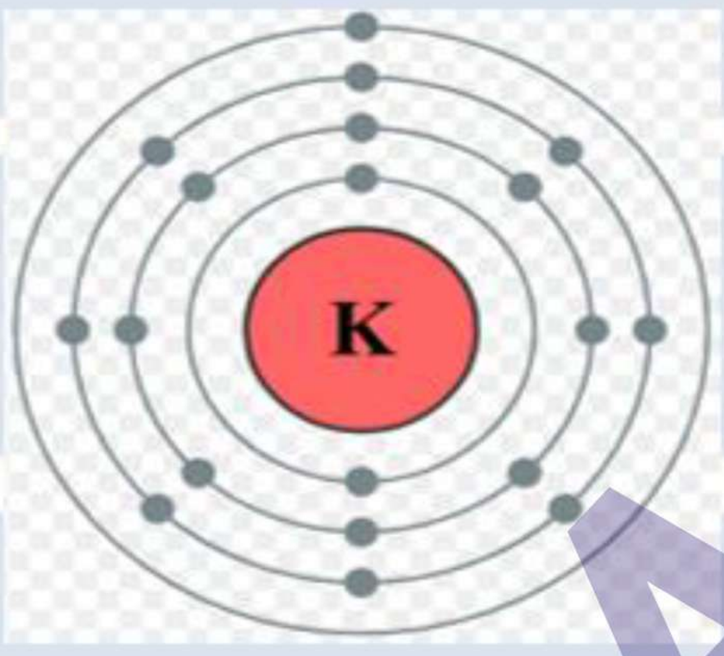
1-H Hydrogen
2-He Helium
3- Au Gold
4-Ag silver
5-Pb lead
6-S sulfur

Q4: Write the electronic Configuration for the following elements:

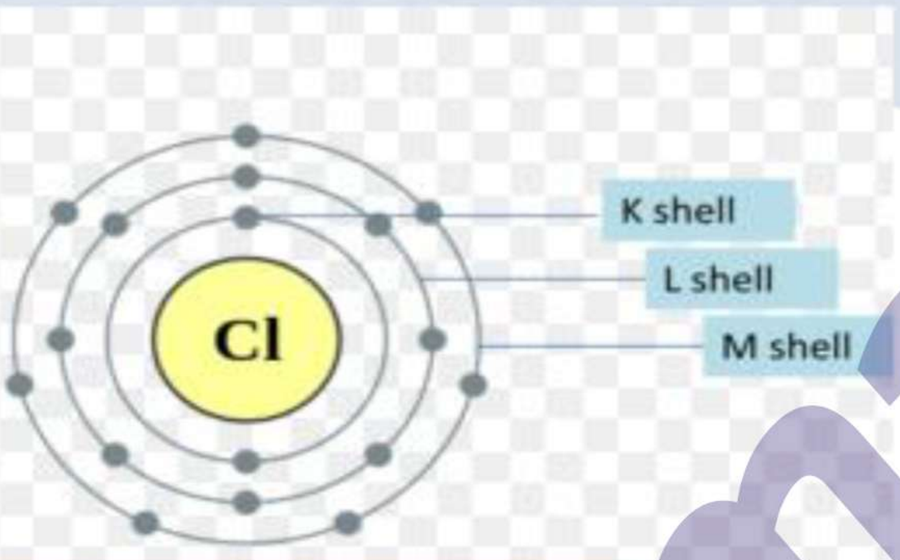
1. ($_7$N)



2. ($_{19}$K)



3. ($_{17}$Cl)



Chlorine (2,8,7)
(17 electrons =1st , 2nd , and 3rd orbit)

Unit 1 – lesson 3 – part 2

Atomic structure of matter

1: Complete the following:

1- Atomic number is the number of ----protons---------- in the nucleus or the number of ------electrons---------- around the nucleus.

2- Mass number of the number of ---------protons---- and --------neutrons----

3- The rule ---------$2n_2$---------- tells the numbers of the electrons fill the energy level

4- The 2nd energy level satisfied by ----------8--------- electrons.

5- Exited atom is the atom that gains ------quantum of energy-------

6- The quantum is the amount of ----energy---------- lost or gained by an -------electron---------- when it transfers from an energy level to another.

7- If the number of electrons in the outermost energy level is equal to 8, the atom becomes --------inactive----

8- If the number of the electrons in the outermost energy level is less than 8 electrons, the atom becomes -----active-/unstable-

2- Calculate the following:

1- If the nucleus of Sodium atom contains 11 protons and neutrons, find the atomic number and the mass number of Sodium

----------atomic number=11----------

----------mass number=11+11=22

2- If the nucleus of Calcium atom contains 20 protons and the mass number is 40, find the atomic number and the number of neutrons

atomic number = 20

Mass number=20+20=4

3: What is meant by?

1. The atomic number of Oxygen is 8

------ The atomic number = no. of protons in the nucleus or the number of electrons in the energy levels----------

2. The mass number of Oxygen 16

---------- the sum of the numbers of protons & neutrons in the nucleus=16---

What's meant by:

(Unit 1)

1- Density:

It is the mass of unit volume of matter. D =M/V

2- Melting point:

It is the temperature at which matter begins to change from a solid state to a liquid state.

3- Molecule:

It is the smallest part of matter which can exist freely and it has the properties of matter.

4- Intermolecular spaces:

They are the spaces that found among the molecules.

5- Intermolecular force:

It is the force that bonds the molecules together.

6- Latent heat of melting:

It is the amount of heat required to change 1 kg. of substance from solid state to the liquid state without changing in the temperature [although heating is continued]

7- Element:

It is the simplest pure form of matter which can't be analyzed chemically into simple form & it composed of similar atoms.

8- Compound:

It is a substance which is formed from combination of atoms of two or more different elements with constant weight ratios.

Because, when the air is cooled, its density increase so it, falls down to cool the room or (to cool the food in the refrigerator), while the hot air (of low density) rises up to be cooled again and so on.

9- The electric heater is placed at the bottom of the room.

When the air (around the heater) is heated, its density decreases so, it rises up to warm the room, while the cold air of high density falls down to be heated again and so on.

10- The heat of the sun doesn't reach to the Earth by conduction or convection.

It is not transferred by conduction, because air is a bad conductor for heat and it is not transferred by convection because the space between the sun and the atmosphere of the earth does not contain any medium through which heat could be transferred.

11- The production of electricity from solar energy is preferred to that which produced from burning of fuel.

Because solar energy is a clean source of energy which doesn't pollute the environment and it is a permanent source of energy.

12- You feel hot when you touch a hot metallic spoon.

Due to the transfer of heat of object of high temperature (metallic spoon) to the object of low temperature (you) and the metallic spoon is a good conductor of heat.

Give reasons for each of the following (U 3)

1- We can distinguish between banana plant and Molukhiah plant.

Because banana plant carries large sized leaf while the molukhiyah plant carry small sized leaf.

2- Cycas is a gymnosperm plant.

Because its seed is formed inside cones and not inside a pericarp (fruit envelope).

3- The front teeth of hedgehog are extending out wards.

To capture insects.

4- The diversity of living organisms.

To adapt with the environmental changes such as climate change, food diversity and existence of water.

5- Horse's limbs end in a strong solid hoof.
To help the horse go through the rocky soil.
6- Bird migration is a behavioral adaptation.
Because it is an adaptation in the activity of some animals in different times of the day light.
7- Beaks and legs of birds are modified in many different ways.
Because long thin beaks to pick up worms and snails while the legs long thin legs ending in thin fingers to walk in the existence of water.

8- Insectivorous plants cannot make proteins by themselves.
Because they can't absorb the nitrogenous substances needed to make proteins from the soil.
9- The legs of predatory birds have three anterior fingers and posterior
one.
Three anterior and one posterior to firm pouncing the prey.
10- Some animals hibernate in winter.
Due to the decrease of temperature.
.

Important Laws:

1) Work (w) = Force (f) × Displacement (d)
2) Weight = mass × Acceleration of gravity
3) potential energy (P.E) = weight (w) × height (h)
4) Kinetic energy (k.E) = $\frac{1}{2}$ mass (m) × (velocity)^2 $(v)^2$

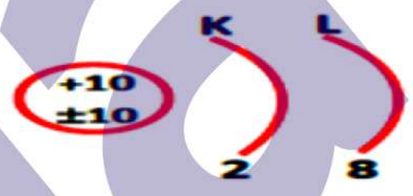
Important units:

1) Work → Joule
2) force → Newton
3) Displacement → metre
4) weight → Newton
5) mass → k.g
6) Acceleration of gravity → Newton
$\simeq$ 9.8 = 10 k.g
7) P.E → Joule
8) Height → meter
9) K.E → Joule
10) velocity → m/sec

Important electronic configurations:

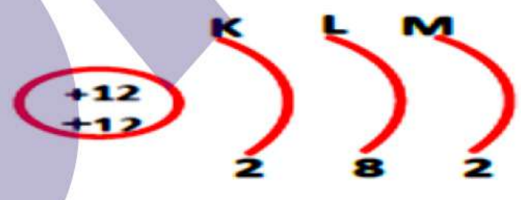
$^{20}_{10}Ne$, $^{24}_{12}Mg$, $^{40}_{20}Ca$, $_{9}F$

$^{20}_{10}Ne$
no. protons → 10
no. neutrons → 10
no. electrons → 10



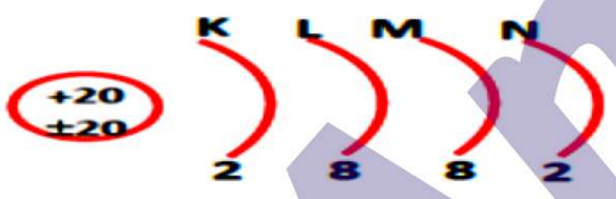
nobel gas

$^{24}_{12}Mg$
no. protons → 12
no. neutrons → 12
no. electrons → 12



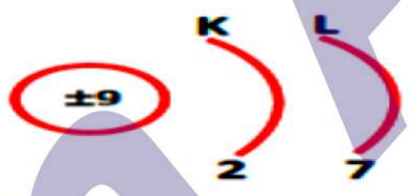
metal

$^{40}_{20}Ca$
no. protons → 20
no. neutrons → 20
no. electrons → 20



metal

$^{17}_{9}F$
no. protons → 9
no. neutrons → 8
no. electrons → 9



non metal

Energy transformation:

Technological application	Energy transformations
1- simple cell	Chemical energy → electric energy
2- Electric Lamp	Electric energy → light & heat energy
3- Car engine	a) chemical energy (stored in fuel changes by burning) → thermal energy b) thermal energy → mechanical energy
4- car dynamo	Mechanical energy → electric energy
5- car lamps	Electric energy → light energy
6- car radio	Electric energy → sound energy
7- Electric heater of car (air conditioner)	Electric energy → heat energy
8- sewing machine	Electric energy → mechanical (kinetic energy)
9- solar cell on solar battery	Solar energy → electric energy
10- television	Electric energy → light & sound energy
11- Alarm clock	Chemical energy (stored in battery) Kinetic & sound energy
12- cellular phone	Electromagnetic waves → sound energy
13- solar heater	Solar energy → heat energy
14- solar oven	
15- solar furnace	

9- Atom:

- It is the fundamental building unit of matter

- It is the smallest individual unit of matter which can share in chemical

reaction.

10- Atomic number:

It is the number of protons in the nucleus of an atom and = number of electrons.

11- Mass number:

It is the sum of the numbers of protons and neutrons in the nucleus of an atom.

12- Energy levels:

They are imaginary regions around the nucleus in which the electrons move according to their energies.

13- Quantum of energy:

It is the amount of energy lost or gained by an electron when it transfers from one energy level to another.

14- The excited atom:

It is the atom that gains a quantum of energy.

(Unit 2)

1) Energy

It is the ability to do work or to make a change.

2) The mechanical energy:

It is the summation of potential and kinetic energies of the body.

3) Potential energy:

It is the stored energy in the object due to a work done on it.

4) Kinetic energy:

It is the work done during the motion of an object or it is the energy of the moving body.

5) The conservation law of mechanical energy:

The sum of potential and kinetic energies of an object under the effect of gravity is a constant value.

6) The conservation law of energy:

Energy is neither created nor destroyed, but it is converted from one form to another.

7) Heat energy:

It is a form of energy which transfers from the object of higher temperature to that of lower one.

8) The temperature:

It is the condition which states the direction of heat energy whether from or to the object when it comes in contact with another and it is directly proportional the particles kinetic energy.

9) conduction

It is the transfer of heat through solids from the part of higher temperature to the part of lower temperature.

10) Convection

It is the transfer of heat in gases and liquids, where hot molecules have less density and rise up wards, while colder molecules have more density, and fall down.

11) Radiation

It is the transfer of heat from hot object to another without any need for a material medium through which heat transfers in different directions.

(Unit3)

1- Micro – organisms

They are living organisms that cannot be seen by naked eye, but they spread everywhere around us, in air water and soil.

2- Gymnosperms

They are plants, their seeds are formed inside cones and not inside a pericarp (fruit envelope)

3- Angiosperms (flowering plants)

They are plant, their seeds are formed inside apericarp.

4- Arthropods:

They are invertebrate animals that are characterized by the presence of jointed legs.

5- Arachnids:

Arthuropods that have four pairs of legs. Ex (spiders, scorpions)

6- Myriapods:

Arthropods that have numerous legs. Ex: scolopendra, Julius.

7- Rodents:

They are mammals have one pair of incisors in each jaw.

8- Lagomorphs:

They are mammals have two pairs of incisors in the upper jaw and one pair in the lower jaw.

9- Taxonomy:

It is a branch of biology that searches for the similarities and the differences among living organisms and it places the similar

ones in groups according to a certain system in order to ease their study.

Species:

It is a group of more similar living organisms in shape that can reproduce to give birth of new fertile individuals which are able to reproduce and keeping the existence of the species.

11- Adaptation:

It is a modification of living organism's behavior, body structure or organs biological functions to become more adapted to the environmental conditions which it lives in.

12- Structural adaptation (Anatomical):

It is an adaptation that studies the structure of one body organ.

13- Functional adaptation:

It is an adaptation of some organs and tissues to do a specific function.

14- Behavioral adaptation:

It is an adaptation in the activity of some animals in different times of the day light.

Give reasons for each of the following (Unit 1)

Equal masses of different substances have different volumes. or Equal volumes of different substances have different masses.
Because they have different densities.

2- The iron nail and the metallic coin sink in water while the piece of wood floats on the water surface.
Because coin and nail have density higher than water while piece of wood has density lower than water.

3- Water is not used to extinguish petrol fires.
Because the density of petrol is less than that of water so, petrol floats on water surface and doesn't put out the fire.

4- Balloons filled with hydrogen or helium rise up in air carrying flags.
Because the densities of hydrogen and helium are less than the density of air.

5- Melting point is used to separate between different substance.
Because each substance has a definite melting point which differs from the others.

6- Electric wires are made of copper or aluminum.
Because they are good conductors of electricity.

7- Screw driver are made of steel, while their handles are made of wood or plastic.
Because steel is a good conductor of electricity but wood and plastic are bad conductors of electricity.

8- Cooking pans are made of aluminum.
Because it is a good conductor of heat and it has a high melting point and it is easy to transfer heat.

9- Handles of cooking pans are made of wood or plastic.
Because wood and plastic are bad conductors of heat.

10- Sodium and potassium are kept under kerosene surface.
To prevent their reaction with atmospheric oxygen as they are active metals.

11- Steel bridges and the holders of light bulb are painted from time to time.
- Metallic spare parts of cars are covered with grease.
To protect them from rust and corrosion.

12- Washing of cooking pans made of aluminum with a rough material.

To remove any layer formed on them.

13- Silver and gold are used in making jewels.

Because they are chemically poor active.

14- Nickel, gold and silver are used to cover other substances which rapidly gain rust.

To protect them from rust and corrosion.

15- When you leave the perfume bottle opened, you smell it all over the room.

Because the molecules of the perfume are in continuous motion and they keep the properties of perfume.

A drop of ink spreads through water.

Because the molecules of ink are in a continuous motion in all directions among water molecules.

17- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

Because some molecules of alcohol occupy the intermolecular spaces among water molecules.

18- It is difficult to break an iron piece with your hand.

Because there is strong attraction force (intermolecular force) among iron molecules.

19- The atom is electrically neutral in its ordinary state.

Because the number of positive protons inside the nucleus is equal the number of negative electrons which revolve around it.

20- The mass of the atom is concentrated in the nucleus.

Because the electron has a negligible mass relative to that of proton or neutron.

21- The nucleus is positively charged.

Because it contains protons that positively charged particles and neutrons that electrically neutral particles.

22- Nobel gases don't enter a chemical reaction through ordinary conditions.

Because the outermost energy levels of their atoms are completely filled with electrons.

23- When adding an amount of table salt to water it disappears after a time

Due to the presence of the inter molecules space among water molecules.

Give reasons for each of the following (Unit 2)

1- The fuel inside the car is similar to the food inside the body of the living organisms.

Because burning each of them produce energy which makes the car move and living organism do work.

2- The developed countries aim to use solar energy, wind energy and
the movement of water more than before.

Because they are cheap resources of energy and do not pollute the environment.

3- The weight of an object is different from its mass.

Because the weight = mass × acceleration of gravity.

4- The kinetic energy will increase four times as the velocity of the moving object is doubled.

Because kinetic energy is directly proportional to the square of velocity. K.E α v_2

5- In the simple pendulum, the kinetic energy of the vibrating body is maximum when it passes its original position during its movement.

Because when the pendulum passes its original position, its velocity is maximum.

6- When the ball of pendulum reaches the maximum height the potential
energy equals the mechanical energy.

Because when the ball reaches the maximum height its velocity is zero so the kinetic energy is zero.

7- Car engine is important to the car.

Because the chemical energy stored in the fuel changes by burning into thermal energy and thermal energy changes into mechanical energy (to move the car).

8- The freezer of the fridge is found at the top of the fridge.
- The air conditioner is fixed at the upper part of room.

Final revision on unit 1

Q1: Choose the correct answer:

1. ---------- revolve around the nucleus in energy levels at a high speed.
   (Neutrons – Electrons – Protons – Atoms)
2. The nucleus of an atom contains ------
   (protons and neutrons – neutrons and electrons – protons and electrons – protons, electrons and neutrons)
3. A piece of iron of 80 gm and its volume is 20 cm^3,so its density = ….
   (160- 100 – 4 – 0.25) gm/cm^3
4. Molecules of inert gases are composed of ----- atom (s).
   (one – two – three – one or two)
5. The copper symbol is ----------.
   (Ca – C – Cu)
6. The number of electrons which saturates the fourth energy level is ---------.
   (32 – 18- 8)
7. All the following substances conduct electricity except ----------.
   (copper – silver – wood)
8. Electric conductivity is a distinguishing factor between ----------.
   (wood and plastic – iron and wood – iron and copper)
9. --------- is known as the number of protons and neutrons existed in nucleus of the atom.
   (Atomic no – Mass no – Density)
10. The measuring unit of density is -------
(g/cm – g/cm^2 – Kg/cm^3 – g/cm^3)
11. The volume of mixture of 50cm^3 alcohol and 150 cm^3 of water is ----- 200 cm^3.
    (more than – less than – equal to)

Q2: Complete the following statements:

1. The liquid element which is composed of one atom is ----------.
2. ---------- is the temperature at which a substance changes from liquid to gas.
3. An alloy of --------- is used in making jewels, while an alloy of ------ is used in making heating coils.
4. Sodium symbol is ---------, while hydrogen symbol is ----------.
5. Metallic bridges are painted from time to time in order to protect them from ---------.
6. The ---------- takes the shape and the volume of its container.
7. The intermolecular forces among molecules of solids are ----------, in liquids are ---------- and in gases are ----------.
8. The measuring unit of volume is --------- and that of mass is ------.
9. Ammonia molecule is composed of --------- hydrogen atoms and one ---------- atom.

10. An atom contains 18 neutrons inside its nucleus and 7 electrons in the third energy level, therefore its atomic number= ---------- and its mass number= ---------.

11. Some solids as ---------- are soft at ordinary temperature.

12. Protons are ---------- charged particles.

Q3: Give reasons for:

1. The atom is electrically neutral.

2. Wood floats on water surface, while iron sinks in it.

3. Cooking pots are made of aluminum, while their handles are made of wood.

4. The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing

Q4: Problem:

1. An object of density 0.5 gm/cm^3 and volume 10 cm^3. Find its mass? And if you know the density of water is 1 g/cm^3 does this object sink in water and why?

2. A piece of iron, its mass is 78gm is put in a graduated cylinder containing 100 cm^3 of water, the reading of the cylinder becomes 110 cm^3, calculate the density of iron?

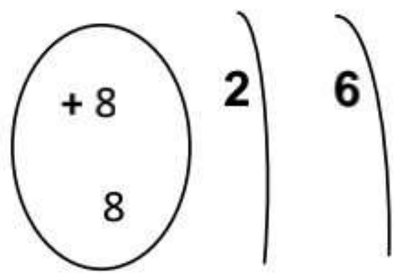
Q5: If you have an element such as ($^{20}_{10}Ne$):

a. What is the element name of this symbol?
----------.
b. What is the atomic number of this element?
----------.
c. Does this element enter a chemical reaction and why?
----------.

Q6: Study the following figure then answer:

1. What is the mass number of this element?

2. What is the number of electrons in the outermost energy level?



Revision on unit 2

Q1: Complete the following statements:

1. Heat is a form of ---------- which transfers from the object of ---------- temperature to another of ---------- temperature.
2. Heat transfers by three methods which are ----------,---------- and ----------.
3. Heat is transferred through air by ---------- and ----------.
4. The potential energy increases by increasing the --------- of the body and its ---------- from the ground.
5. The measuring unit of work is ---------- , while that of force is --------.
6. The measuring unit of energy is ----------.
7. ---------- is a permanent resource of energy, while ---------- is a renewable source of energy.
8. Mechanical energy = ----------+ ----------.
9. Potential energy = ---------- x ----------.
10. Kinetic energy = ½ x ---------- x ----------.
11. In the simple cell, the -------- energy changes into --------- energy.
12. The simple cell consists of ------ solution dipped in it two different ----------
13. Friction turns ---------- energy into ----------energy.
14. By increasing the particles movement, the temperature ----------.
15. Heat transfers through solids from one end to another by ----------.

Q2: Choose the correct answer:

1. An object of 5 Kg moves with velocity of 5 m/s, its kinetic energy is ----------joules.

(62.5 – 125 – 12.5 – 25)

2. When the height of an object is doubled, its ----------.

(kinetic energy doubled – mechanical energy will be four times its value – potential energy will be doubled – potential energy will be three times its value)

3. On rubbing your hands, the ----------.

(heat energy is converted into sound energy – kinetic energy is converted into heat energy – heat energy is converted into kinetic energy – sound energy is converted into heat energy)

4.The heat is transferred through solids by ----------

(conduction & convection – conduction & radiation – radiation only – conduction only)

5. The sun is ----------

(a resource of permanent energy – a resource of non permanent energy –not an energy resource – producing no energy)

6. In the electric bulb, electric energy changes into ----------

(heat energy only – light energy only – chemical energy – heat energy and light energy)

7. In home when gas stove is working there is a change from ---------.

(heat energy into a chemical one – chemical energy into a heat one – chemical energy into a sound one – light energy into heat one)

8. Mechanical energy is converted into heat energy by ----------.
   (chemical reaction – friction – electric lamp)
9. Food and fuel are sources of energy ----------
   (Chemical – mechanical – electric –sound)
10. --------- is from the clean sources of energy.
    (Petrol –Coal –Wood – Wind)
11. In the simple pendulum, the
    (mechanical energy changes into sound energy – mechanical energy changes into light energy – Kinetic energy changes into heat energy – Potential energy changes into kinetic energy and vice versa)
12. In the solar cells, the solar energy changes into --------- energy.
    (kinetic – potential – sound – electric)

Q3: Give reason for:

1. The fuel inside the car is similar to the food inside the body of living bodies.
2. The freezer is found at the top of the fridge.
3. The production of electricity from solar energy is preferred than burning of fuel.
4. Heater is put at the bottom of the room.
5. Energy is neither created nor destroyed.

Q4: Problems:

1. Find the weight of an object of potential energy 88 joules when found at a height 11 m.
2. An object has a kinetic energy 46 joule and is moving at a speed 4 m/s find the object mass.

Q5: Write the scientific term:

1. A form of energy stored in the food. (----------)
2. The ability to do work or to make a change. (----------)
3. The energy stored in the object due to work done on it. (----------)
4. The way by which the heat is transferred through gases and liquids. (----------)

Q6: What is meant by:

1. Potential energy of an object = 50 joules.

2. Kinetic energy of an object = 10 joules.

3. Mechanical energy of a moving body = 100 joules.

Q7: Mention the changes of energy in each of the following:

1. Sewing machine: ----------.
2. Alarm clock: ----------.
3. Television : ----------.

Final revision on unit 3

Q1: Complete the following sentences:

1. ----------, ---------- and ---------- are micro organisms that live in water.
2. Plants carry large – sized leaves such as ---------- and carry small- sized leaves such as -------
3. --------- and ---------- belong to teethless mammals.
4. Horse's limbs end in ---------- to run over rocky soil, while camel's limbs end in -------- to walk on hot sandy soil.
5. ----------, ---------- and ---------- are examples of insectivorous plants.
6. ---------- and ---------- are examples of predatory birds which feed on ----------.
7. Ducks and geese feed on ---------- and ----------.
8. Bird's migration is an ---------- adaptation.
9. In winter, some birds are adapted to the change in the environmental conditions by ---------- process.
10. The birds migrate from ------ regions to --------- regions to more lighted and warmer regions.

Q2: Choose the correct answer:

1. ---------- is from the animals that aestivate in summer.

   (Rat – Rabbit – Jerboa – Duck)

2. ---------- is(are) considered from the animals that tend to hibernate.

   (Frog – Jerboa – Snail – Camel)

3. The organs of birds that are adapted for feeding are the ---------.

   (beaks and wings – beaks and eyes – beaks and legs – wings and eyes)

4. Secretion of sweat on rising human body temperature is ---------- adaptation.

   (functional – anatomical – behavioral – structural)

5. Mammals move by all the following ways except ----------.

   (swimming – flying – absorption – running)

6. All the following are arthropods having three pairs of jointed legs except ----------.

(cockroach - bee – locust – scolopendra)

7. The number of pairs of legs in scorpion is --------

(3 – 4 – 44 -100)

8. Pea plant belongs to ---------- plants.

(ferns – dicotyledon – monocotyledon – short weeds)

9. ---------- belongs to the animals that have no body support.

(Mussel – Hedgehog – Octopus – Rabbit)

10. Cycas plant belongs to ----------.

(angiosperms – brown algae – gymnosperms – large leaves plants)

11. All the following are animals that live in water except ----------.

(fish – octopus – jelly fish – rat)

12. All the following are unicellular organisms except ----------.

(amoeba – paramecium – euglena – rhinoceros)

Q3: Write the scientific term:

1. They are plants reproduce by formation of spores. (----------)
2. Animals that their bodies have an internal support. (----------)
3. The modification of a living organism's behavior, body structure or organs function in order to be able to live in different environments. (----------)

Q4: Give reasons for:

1. Some plants catch and digest insects.
2. Some animals hibernate in winter.
3. Camel doesn't need to sweat in the environment.
4. The beak of hawk is long and sharp crooked beak.

Q5: Mention the difference between each of the following:

1. Insects and arachnids.
2. The structure of camel's foot and horse's foot.

Q6: Choose from columns(B) and (C) what suits in column (A):

(A)	(B)	(C)
1. Hawks and vultures 2. Ducks and geese 3. hoopoe	a. have long thin beaks. b. Migrate from hot region. c. Have strong and sharp beaks. d. Have wide indented beaks in the two sides.	a. To filter food. b. To help them in walking in the presence of water. c. To pick up worms and snails. d. To reproduce in warm regions. e. To tear the prey.

Q7: Choose the correct answer:

1. Front limbs in whales are modified to ----------

(wings – hoofs – paddles – legs)

2. Adiantum is an example of ----------

(angiosperm – gymnosperm – ferns – algae)

3. ---------- is an example of myriapods.

(bee – spider – ant – scolopendra)

4. ---------- is from the microscopic organisms.

(Euglena – Art – Jerboa – Sloth)

5. In rodents, the incisors number in lower jaw is ----------.

(one pair – two pairs – three pairs – none)

6. Types of adaptation in living organisms are ----------.

(structural – functional and behavioral – all the answers are right)

7. From the animals which haven't supporting in their bodies are -------.

(reptiles – snails – jellyfish – hedgehog)

8. The insects have ------pairs of jointed legs.

(one – two – three – four)

9. The number of the anterior fingers in a hawk is -------- finger(s).

(3 – 4 – 2 – 1)

Q8: Give an example for each of the following:

1. An animal with teeth pointed towards. ----------

2. A monocotyledon plant. ----------

3. A dicotyledon plant. ----------

4. An animal doesn't have teeth. ----------

5. An animal with canines and molars. ----------

6. Camouflage in insect. ----------

Q9: What are the adaptation of camel for living in desert environment?

Q10: Choose from column (B) what suits in column (A):

(A)	(B)
1. Insects 2. Rodents 3. Edentates 4. Myriapods 5. Predatory birds	a. Have no support. b. Have sharp crooked beaks. c. Have no teeth. d. Have 3 pairs of jointed legs. e. Have large number of jointed legs. f. Have one pair of incisors in upper jaw.

Q11: How can the organisms adapted to overcome the environment conditions?

1. Desert snail to overcome the increase of temperature in summer.
2. Hoopoe bird to overcome the decrease of temperature in winter.
3. Camel to overcome the shortage of food and water.
4. Chameleon to avoid its predators.

Q12: Complete the following:

1. The blood temperature of camel changes from ---------- in the morning to ---------- during the daylight.
2. The armadillo is considered from the ---------- mammals.
3. Hawks have ---------- beaks to tear the prey.
4. Lagomorphs have ---------- of incisors in the upper jaw and ----------in the lower jaw.
5. Vougheir is an example for plants that reproduce by ----------.
6. The ant belongs to ----------, while the scolopendra belongs to ----------.

Q13: Choose the correct answer:

1. The scorpion belongs to ---------

   (insects – myriapods –arachnids – mammals)
2. ---------- is an example for plants that reproduce by spores.

   (Pine – Bean – Vougheir – Wheat)
3. ---------- are from the animals which don't have a body support.

   (Reptiles – Snails – Jellyfishes – Lions)

4. The number of pairs in scorpion legs is --------

   (3 – 4 – 44 – 100)

5. The examples of living organisms that undergoes hibernation is the ----------.

   (desert snail – jerboa – frog – all the above)

6. Water is stored in the leaves of ---------- plant.

   (elodea – cactus – calamagrostis - wheat)

7. Leaves are reduced into spines in ---------- plant.

   (opuntia – cactus – calamagrostis – elodea)

8. There air chambers in the leaves of ---------- plant.

   (opuntia – cactus – calamagrostis – elodea)

9. The number of the anterior fingers in a hawk is

   (3- 4 – 2 – 1) finger(s).

10. ---------- belongs to the animals with no body support.

    (Octopus – Mussel – Hedgehog – Snake)

11. Camel can survive without drinking water for ----------.

    (3days - 3 weeks – 3 months – a week or more)

12. Pea plant belongs to ---------- plants.

    (fern – monocotyledon – dicotyledon – gymnosperm)

13. ---------is from animals that undergo aestivation.

    (Rat – Frog – Reptiles -Desert snails)

Q14: Complete the following statements:

1. --------- and --------- are teethless mammals.
2. Arthropods can be classified according to the number of legs into ---------- , ---------- and ----------.
3. ---------- and --------- are used in classifying plants.
4. Some plants have large – sized leaves such as ---------- and some has small – sized leaves such as ----------.
5. ---------- is the basic unit of classification in living organisms.
6. ---------- and -------- are examples for insectivorous plants.
7. Hawks have ---------- beaks to tear the prey, while ducks have --------- beaks to filter food from water.
8. Horses' limbs end in --------- to run over rocky soil while camel limbs end in --------- to walk on hot sandy soil.
9. The whale front limbs are modified into ---------- to perform --------- to take the role of ---------- while they modified in the bat into ---------- to take the role of ---------.
10. --------- and ---------- are examples for micro- organisms that live in water.

11. The number of rat's upper jaw incisors is -------- and their number in the rabbit's upper jaw is ----------.
12. Armadillo belongs to --------- mammals and the hedgehog belongs to --------- mammals.
13. Camel's blood temperature changes from -------°C in early morning into -------- °C during daylight hours.
14. ---------- is from the plants that reproduce by the formation of spores while ---------- is from the plants that produce seeds inside cones.

Q15: Give reason for:

1. Hedgehog has front teeth extending outwards .
2. Some plants pounce insects.
3. Some birds have long thin beaks and their long legs end in thin claws.
4. Some animals undergo hibernation.
5. Some species of birds migrate from their original regions in winter.
6. Camel's fur is distributed at different densities on its body regions.

Q16: Give an example showing each of the following:

1. Camouflage in insects. ----------
2. Hibernation in mud. ----------
3. Aestivation in humid burrows. ----------

Q17: Give one difference between each of the following:

1. Rodents and lagomorphs.
2. Beans plant and maize plant.

Unit 1 model answer

Q1: Choose the correct answer:

1. ---------- revolve around the nucleus in energy levels at a high speed.
   (Neutrons – Electrons – Protons – Atoms)
2. The nucleus of an atom contains ----------.
   (protons and neutrons – neutrons and electrons – protons and electrons – protons, electrons and neutrons)
3. A piece of iron of 80 gm and its volume is 20 cm^3,so its density = ----.
   (160- 100 – 4 – 0.25) gm/cm^3
4. Molecules of inert gases are composed of -------- atom (s).
   (one – two – three – one or two)
5. The copper symbol is ----------.
   (Ca – C – Cu)
6. The number of electrons which saturates the fourth energy level in the atom is ----------.
   (32 – 18- 8)
7. All the following substances conduct electricity except ----------.
   (copper – silver – wood)
8. Electric conductivity is a distinguishing factor between ----------.
   (wood and plastic – iron and wood – iron and copper)
9. --------- is known as the number of protons and neutrons existed in nucleus of the atom.
   (Atomic no – Mass no – Density)
10. The measuring unit of density is ----------.
    (g/cm – g/cm^2 – Kg/cm^3 – g/cm^3)
11. The volume of mixture of 50cm^3 alcohol and 150 cm^3 of water is ---------- 200 cm^3.
    (more than – less than – equal to)

Q2: Complete the following statements:

1. The liquid element which is composed of one atom is mercury.
2. Boiling point is the temperature at which a substance changes from liquid to gas.
3. An alloy of gold and copper is used in making jewels, while an alloy of nickel and chrome is used in making heating coils.
4. Sodium symbol is Na , while hydrogen symbol is H.
5. Metallic bridges are painted from time to time in order to protect them from rusting.
6. The gas state takes the shape and the volume of its container.
7. The intermolecular forces among molecules of solids are very strong, in liquids are medium and in gases are very weak.
8. The measuring unit of volume is Cm^3 or m^3 and that of mass is Kg or gm.
9. Ammonia molecule is composed of three hydrogen atoms and one nitrogen atom.
10. An atom contains 18 neutrons inside its nucleus and 7 electrons in the third energy level, therefore its atomic number= 7 and its mass number= 25.
11. Some solids as rubber are soft at ordinary temperature.
12. Protons are positively charged particles.

Q3: Give reasons for:

1. The atom is electrically neutral.
   Because the no of positive protons in the nucleus is equal to the no of negative electrons which revolve around the nucleus.
2. Wood floats on water surface, while iron sinks in it.
   Because wood has less density than water but iron has more density than water.
3. Cooking pots are made of aluminum, while their handles are made of wood.
   Because aluminum is good conductor of heat but wood is bad conductor of heat.
4. The volume of a mixture of water and alcohol is less than the sum of their volumes before being mixed together.
   Because there are intermolecular spaces between the molecules of water and alcohol.

Q4: Problem:

1. An object of density 0.5 gm/cm^3 and volume 10 cm^3. Find its mass? And if you know the density of water is 1 g/cm^3 does this object sink in water and why?

Solution:

Volume = 10 cm^3 , Density = 0.5 gm/cm^3 , mass = ?

Density = mass /volume , So mass = density x volume = 0.5 x 10 = 5 gm

This object will float because it has less density (0.5 gm/cm^3) than the density of water (1gm/cm^3)

2. A piece of iron, its mass is 78gm is put in a graduated cylinder containing 100 cm^3 of water, the reading of the cylinder becomes 110 cm^3, calculate the density of iron?

Solution:

mass= 78 gm , The volume of water= 100 cm^3 , the volume of water and iron = 110 cm^3

So

The volume of iron only = 110 – 100 = 10 cm^3

Density = mass/ volume = 78 / 10 = 7.8 gm/cm^3

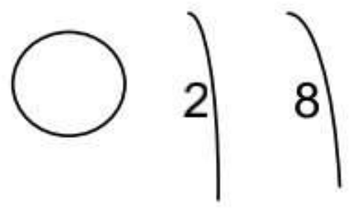
Q5: If you have an element such as ($^{20}_{10}Ne$):

a. What is the element name of this symbol?
Neon element.

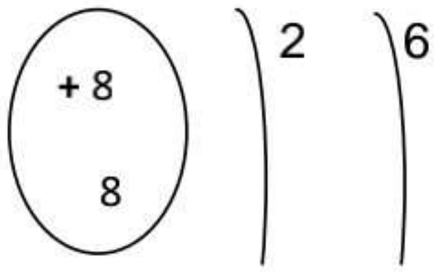
b. What is the atomic number of this element?
Atomic number = 10.

c. Does this element enter a chemical reaction and why?
It will not enter a chemical reaction because the outer energy level of this atom is completely filled with 8 electrons.

No of electrons = 10



Q6: <u>Study the following figure then answer:</u>



1. What is the mass number of this element?

Mass no = no of protons + no of neutrons

Mass no = 8 + 8 = 16

2. What is the number of electrons in the outermost energy level?

No of electrons in the outermost energy level = 6

<u>Revision on unit 2 (Model answer)</u>

<u>Q1: Complete the following statements:</u>

1. Heat is a form of <u>energy</u> which transfers from the object of <u>high</u> temperature to another of <u>low</u> temperature.
2. Heat transfers by three methods which are <u>conduction</u> , <u>convection</u> and <u>radiation</u>.
3. Heat is transferred through air by <u>convection</u> and <u>radiation</u>.
4. The potential energy increases by increasing the <u>weight</u> of the body and its <u>height</u> from the ground.
5. The measuring unit of work is <u>Joule</u>, while that of force is <u>Newton</u>.
6. The measuring unit of energy is <u>Joule</u>.
7. <u>Sun</u> is a permanent resource of energy, while <u>wind</u> or <u>water movement</u> is a renewable source of energy.
8. Mechanical energy = <u>Potential energy</u> + <u>Kinetic energy</u>.
9. Potential energy = <u>weight</u> x <u>height.</u>
10. Kinetic energy = ½ x <u>mass</u> x <u>Velocity^2</u>.
11. In the simple cell, the <u>chemical</u> energy changes into <u>electric</u> energy.
12. The simple cell consists of <u>acidic</u> solution dipped in it two different <u>metals(zinc and copper)</u>.
13. Friction turns <u>mechanical</u> energy into <u>heat</u> energy.
14. By increasing the particles movement, the temperature <u>increases</u>.
15. Heat transfers through solids from one end to another by <u>conduction</u>.

<u>Q2: Choose the correct answer:</u>

1. An object of 5 Kg moves with velocity of 5 m/s, its kinetic energy is ----------joules.
(<u>62.5</u> – 125 – 12.5 – 25)
2. When the height of an object is doubled, its ----------.
(kinetic energy will be doubled – mechanical energy will be four times its value – <u>potential energy will be doubled</u> – potential energy will be three times its value)
3. On rubbing your hands, the ----------.
(heat energy is converted into sound energy – <u>kinetic energy is converted into heat energy –</u> heat energy is converted into kinetic energy – sound energy is converted into heat energy)
4. The heat is transferred through solids by ----------.
(conduction & convection – conduction & radiation – radiation only – <u>conduction only)</u>
5. The sun is ----------.
(<u>a resource of permanent energy</u> – a resource of non permanent energy –not an energy resource – producing no energy)
6. In the electric bulb, electric energy changes into ----------.

(heat energy only – light energy only – chemical energy – heat energy and light energy)

7. In home when gas stove is working there is a change from ---------.

(heat energy into a chemical one – chemical energy into a heat one – chemical energy into a sound one – light energy into heat one)

8. Mechanical energy is converted into heat energy by ----------.

(chemical reaction – friction – electric lamp)

9. Food and fuel are sources of energy ----------.

(Chemical – mechanical – electric –sound)

10. --------- is from the clean sources of energy.

(Petrol –Coal –Wood – Wind)

11. In the simple pendulum, the ----------.

(mechanical energy changes into sound energy – mechanical energy changes into light energy – Kinetic energy changes into heat energy – Potential energy changes into kinetic energy and vice versa)

12. In the solar cells, the solar energy changes into --------- energy.

(kinetic – potential – sound – electric)

Q3: Give reason for:

1. The fuel inside the car is similar to the food inside the body of living bodies.

Because fuel gives the car energy needed for its motion and food gives us energy needed to do our activities.

2. The freezer is found at the top of the fridge.

Because when the air is cooled, its density increases so it falls down to cool the fridge and the hot air rises up to be cooled because it has less density.

3. The production of electricity from solar energy is preferred than burning of fuel.

Because the solar energy from the clean energy sources and is not polluted to the environment.

4. Heater is put at the bottom of the room.

Because the heater heats the air and when the air heats, it density decreases and rises up to warm the room while the cold air falls down because it has more density.

5. Energy is neither created nor destroyed.

Because it can be changed from one form to another form without loss such as the electric lamb and electric fan.

Q4: Problems:

1. Find the weight of an object of potential energy 88 joules when found at a height 11 m.

Solution:

Given: Height = 11 m , potential energy = 88 joules , weight = ?

Law: Potential energy = weight x height =

$$\text{Weight} = \frac{\text{potential energy}}{\text{Height}} = \frac{88}{11} = 8 \text{ Newtons}$$

2. An object has a kinetic energy 46 joule and is moving at a speed 4 m/s find the object mass.

Solution:

Given: Kinetic energy= 46 joules , speed = 4 m/s , mass =?

Law: Kinetic energy = ½ x mass x speed^2

So mass = $\frac{2 \times \text{kinetic energy}}{\text{Speed}^2} = \frac{2 \times 46}{4^2} = 2.75$ Kg

Q5: Write the scientific term:

1. A form of energy stored in the food. (Chemical energy)
2. The ability to do work or to make a change. (Energy)
3. The energy stored in the object due to work done on it. (Potential energy)
4. The way by which the heat is transferred through gases and liquids. (Convection)

Q6: What is meant by:

1. Potential energy of an object = 50 joules.

The energy stored in the object due to work done on it equals 50 joules

2.Kinetic energy of an object = 10 joules.

It means the energy of the moving body equals 10 joules.

1. Mechanical energy of a moving body = 100 joules.

It means the summation of the potential energy and the kinetic energy of a moving body equal 100 joules.

Q7: Mention the changes of energy in each of the following:

1. Sewing machine: From electric energy into kinetic (mechanical) energy.
2. Alarm clock: From chemical energy into kinetic and sound energies.
3. Television: from electric energy into light and sound energies.

Revise these figures

From the opposite figure: Picture page 49 school book

What happens to the compass?

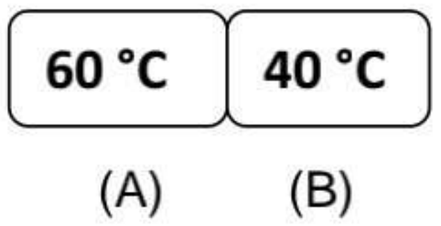
The compass will deflect due to the electric current flows through the circuit.(changing from chemical energy into electric energy)

In the opposite figure, what does the arrows indicate?

(1). Zinc rod.
(2).Copper rod.
(3). Acidic solution. Picture page 49 school book
(4).Glass beaker.
(5).Electric bulb.

Study the opposite figure then answer the following questions:

1. Heat will transfer from Body (A) to body (B).



2. The transfer of heat will stop when the two bodies have the same temperature.

Final revision on unit 3 model answer

Q1: Complete the following sentences:

1. Amoeba, Euglena and Paramecium are micro organisms that live in water.
2. Plants carry large – sized leaves such as banana and carry small- sized leaves such as molukhiyah.
3. Sloth and armadillo belong to teethless mammals.
4. Horse's limbs end in Solid part to run over rocky soil, while camel's limbs end in flat part to walk on hot sandy soil.
5. Drosera, Dionaea and Halophila are examples of insectivorous plants.
6. Hawks and vultures are examples of predatory birds which feed on small animals.
7. Ducks and geese feed on fish and mosses.
8. Bird's migration is a behavioral adaptation.
9. In winter, some birds are adapted to the change in the environmental conditions by hibernation process.
10. The birds migrate from cold regions to warm regions to more lighted and warmer regions.

Q2: Choose the correct answer:

1. ---------- is from the animals that aestivate in summer.
   (Rat – Rabbit – Jerboa – Duck)
2. ---------- is(are) considered from the animals that tend to hibernate.
   (Frog – Jerboa – Snail – Camel)
3. The organs of birds that are adapted for feeding are the ---------.
   (beaks and wings – beaks and eyes – beaks and legs – wings and eyes)
4. Secretion of sweat on rising human body temperature is ---------- adaptation.
   (functional – anatomical – behavioral – structural)
5. Mammals move by all the following ways except ----------.
   (swimming – flying – absorption – running)
6. All the following are arthropods having three pairs of jointed legs except ----------.
   (cockroach - bee – locust – scolopendra)
7. The number of pairs of legs in scorpion is ----------.
   (3 – 4 – 44 -100)
8. Pea plant belongs to ---------- plants.
   (ferns – dicotyledon – monocotyledon – short weeds)
9. ---------- belongs to the animals that have no body support.
   (Mussel – Hedgehog – Octopus – Rabbit)
10. Cycas plant belongs to ----------.
    (angiosperms – brown algae – gymnosperms – large leaves plants)
11. All the following are animals that live in water except ----------.
    (fish – octopus – jelly fish – rat)
12. All the following are unicellular organisms except ----------.
    (amoeba – paramecium – euglena – rhinoceros)

Q3: Write the scientific term:

1. They are plants reproduce by formation of spores. (Ferns plants)
2. Animals that their bodies have an internal support. (Internal animals)
3. The modification of a living organism's behavior, body structure or organs function in order to be able to live in different environments. (Adaptation)

Q4: Give reasons for:

1. Some plants catch and digest insects.

Because they can't absorb the nitrogenous substances needed to make proteins(their food)

2. Some animals hibernate in winter.

To overcome the decreasing of temperature.

3. Camel doesn't need to sweat in the environment.

The camel's blood temperature is not constant but changes from 34^0C to 41^0.

4. The beak of hawk is long and sharp crooked beak.

To be able to tear the prey.

Q5:-Mention the difference between each of the following:

1. Insects and arachnids.

Insects have three pairs of joint legs such as bees and locusts but arachnids have four pairs of joint legs such as spiders and scorpions.

2. The structure of camel's foot and horse's foot.

The camel's foot ends in a thick flat one but the horse's foot ends in a strong solid one.

Q6: Choose from columns(B) and (C) what suits in column (A):

(A)	(B)	(C)
1. Hawks and vultures	A. have long thin beaks.	A. To filter food.
2. Ducks and geese	B. Migrate from hot region.	B. To help them in walking in the presence of water.
3. hoopoe	C. Have strong and sharp beaks.	C. To pick up worms and snails.
	D. Have wide indented beaks in the two sides.	D. To reproduce in warm regions.
		E. To tear the prey.

Q7: Choose the correct answer:

1. Front limbs in whales are modified to ----------.
   (wings – hoofs – paddles – legs)
2. Adiantum is an example of ----------.
   (angiosperm – gymnosperm – ferns – algae)
3. ---------- is an example of myriapods.
   (bee – spider – ant – scolopendra)
4. ---------- is from the microscopic organisms.
   (Euglena – Art – Jerboa – Sloth)
5. In rodents, the incisors number in upper jaw is ----------.
   (one pair – two pairs – three pairs – none)

6. Types of adaptation in living organisms are ----------.
   (structural – functional and behavioral – all the answers are right)
7. From the animals which haven't supporting in their bodies are -------.
   (reptiles – snails – jellyfish – hedgehog)
8. The insects have -------pairs of jointed legs.
   (one – two – three – four)
9. The number of the anterior fingers in a hawk is -------- finger(s).
   (3 – 4 – 2 – 1)

Q8: Give an example for each of the following:

1. An animal with teeth pointed towards. (Hedgehog)
2. A monocotyledon plant. (Wheat – maize)
3. A dicotyledon plant. (Pea – Bean)
4. An animal doesn't have teeth. (Sloth – Armadillo)
5. An animal with canines and molars. (Lion – Tiger)
6. Camouflage in insect. (Leaf insects – stick insects)

Q9: What are the adaptations of camel for living in desert environment?

(1). The Camel has a plenty number of lachrymals glands& 2 rows of long eye lashes to protect its eyes from sand storm – (2). The camel can control the opening& closing of its nostrils to protect its nose from sand storm.

Q10: Choose from column (B) what suits in column (A):

(A)	(B)
6. Insects	g. Have no support.
7. Rodents	h. Have sharp crooked beaks.
8. Edentates	i. Have no teeth.
9. Myriapods	j. Have 3 pairs of jointed legs.
10. Predatory birds	k. Have large number of jointed legs.
	l. Have one pair of incisors in upper jaw.

Q11: How can the following organisms be adapted to overcome the given environment conditions?

1. Desert snail to overcome the increase of temperature in summer.
   Hide in humid burrow which is called aestivation.
2. Hoopoe bird to overcome the decrease of temperature in winter.
   Hide in burrow or mud which is called hibernation.
3. Camel to overcome the shortage of food and water.
   Storing food and water in its hump to be able to survive for 3-4 months
4. Chameleon to avoid its predators.
   Change its color and structure to the color of the environment which is called camouflage.

Q12: Complete the following:

1. The blood temperature of camel changes from 34°C in the morning to 41°C during the daylight.
2. The armadillo is considered from the teeth less mammals.

3. Hawks have sharp crooked beaks to tear the prey.
4. Lagomorphs have two pairs of incisors in the upper jaw and one pair in the lower jaw.
5. Vougheir is an example for plants that reproduce by spores.
6. The ant belongs to insects, while the scolopendra belongs to myriapods.

Q13: Choose the correct answer:

1. The scorpion belongs to ----------.
   (insects – myriapods –arachnids – mammals)
2. ---------- is an example for plants that reproduce by spores.
   (Pine – Bean – Vougheir – Wheat)
3. ---------- are from the animals which don't have a body support.
   (Reptiles – Snails – Jellyfishes – Lions)
4. The number of pairs in scorpion legs is ----------.
   (3 – 4 – 44 – 100)
5. The examples of living organisms that undergoes hibernation is the ----------.
   (desert snail – jerboa – frog – all the above)
6. Water is stored in the leaves of ---------- plant.
   (elodea – cactus – calamagrostis - wheat)
7. Leaves are reduced into spines in ---------- plant.
   (opuntia – cactus – calamagrostis – elodea)
8. There air chambers in the leaves of ---------- plant.
   (opuntia – cactus – calamagrostis – elodea)
9. The number of the anterior fingers in a hawk is ----------.
   (3- 4 – 2 – 1) finger(s).
10. ---------- belongs to the animals with no body support.
    (Octopus – Mussel – Hedgehog – Snake)
11. Camel can survive without drinking water for ----------.
    (3days - 3 weeks – 3 months – a week or more)
12. Pea plant belongs to ---------- plants.
    (fern – monocotyledon – dicotyledon – gymnosperm)
13. ---------is from animals that undergo aestivation.
    (Rat – Frog – Reptiles -Desert snails)

Q14: Complete the following statements:

1. Sloth and armadillo are teeth less mammals.
2. Arthropods can be classified according to the number of legs into insects , arachnids and myriapods.
3. The size and the way of reproduction are used in classifying plants.
4. Some plants have large – sized leaves such as banana plant and some has small – sized leaves such as molukiyah plant.
5. Species is the basic unit of classification in living organisms.
6. Drosera and Dionea are examples for insectivorous plants.
7. Hawks have sharp crooked beaks to tear the prey, while ducks have wide indented beaks to filter food from water.

8. Horses' limbs end in solid part hoof to run over rocky soil while camel limbs end in thick flat part pad to walk on hot sandy soil.
9. The whale front limbs are modified into paddles to perform swimming to take the role of Swimming while they modified in the bat into wings to take the role of flying.
10. Euglena and paramecium are examples for micro- organisms that live in water.
11. The number of rat's upper jaw incisors is one pair and their number in the rabbit's upper jaw is two pairs.
12. Armadillo belongs to edentates (teeth less) mammals and the hedgehog belongs to having teeth extended outwards mammals
13. Camel's blood temperature changes from 34°C in early morning into 41°C during daylight hours.
14. Vougheir is from the plants that reproduce by the formation of spores while Pine is from the plants that produce seeds inside cones.

Q15: Give reason for:

1. Hedgehog has front teeth extending outwards.
   To capture the insects and get food.
2. Some plants pounce insects.

They can't make proteins because they can't absorb the nitrogenous substances needed to make proteins from the soil.

3. Some birds have long thin beaks and their long legs end in thin claws.

They have long thin beaks to help them to pick up worms& snails and long thin legs to help them to walk in the existence of water.

4.Some animals undergo hibernation.
To overcome the decreasing of the temperature.

5. Some species of birds migrate from their original regions in winter.

To escape from low temperature to warmer region to reproduce and get food.

6. Camel's fur is distributed at different densities on its body regions.

To protect camel from extreme cold temperature at night and from sandstorms.

Q16: Give an example showing each of the following:

1. Camouflage in insects. (Leaf or stick insects)
2. Hibernation in mud. (Frog)
3. Aestivation in humid burrows. (Desert snails or jerboa)

Q17: Give one difference between each of the following:

1. Rodents and lagomorphs.

Rodents have one pair of incisors in each jaw such as rat and squirrel but lagomorphs have two pairs of incisors in the upper jaw& only one pair in the lower jaw such as rabbit.

2. Beans plant and maize plant.

Beans are from dicotyledon plant but maize is from monocotyledon plant.

First term final revision

Q1: Complete the following:

1. The unit of volume is ……and that of mass is …..
2. An alloy of …….. is used in making jewels while an alloy of …….. is used in making heater coils.
3. Holders of light bulbs in streets are painted from time to time in order to protect them from ……
4. Some substances conduct heat and electricity such as ……..and …… while other substances don't conduct heat nor electricity such as …….. and ……..
5. The liquid element which its molecule is made of one atom is …….
6. The liquid element where each molecule is composed of two atoms is……
7. Matter is composed of small units called ……..
8. A hydrogen molecule consists of ……. atom (s)
9. A molecule of argon(inert gas) consists of ……. atom (s)
10. …….. and …… are teethless mammals.
11. Arthropods are classified according to the number of legs into……..,
    ……..and ……..
12. The external…….. and the way of ……are used in classifying plants.
13. . ……..is the basic unit of classification of living organisms.
14. …….. and ……..are aquatic micro-organisms.
15. . …… plants reproduce by spores where as ……plants reproduce by seeds inside cones.
16. Electric wires are made from ……
17. The cockroach belongs to ……..where as the scorpion belongs to ……
18. Energy is the ability to exert……
19. The symbol of sodium is…… where as the symbol of sulphur is…….

Q2: Give reasons:

1. Wood floats on the water surface while a piece of lead sinks.
   ……
2. An ice cube changes into liquid water after a period of time.
   ……
   ……
3. The screwdrivers electricians use are made from steel iron & they have wooden handles.
   ……
4. When salt is added to water it disappears.
   ……
5. The volume of a mixture of water and alcohol is less than the sum of their volumes before being mixed together.
   ……
6. A piece of iron isn't broken by hands.
   ……
7. The smell of perfume spreads from an open bottle all over the room.
   ……
8. The atom is electrically neutral.
   ……

9. The 3rd energy level (M) in the atom is saturated with 18 electrons.
……
10. The equation $2n^2$ is not applied to levels higher than the 4^{th} level.
……..
11. Neon gas does not react chemically with other substances.
……
12. The front teeth of the hedgehog extend outwards.
……
13. The mule (the offspring from mating between the donkey & horse) isn't fertile .
……
14. Some birds have long and thin beaks and long legs with thin toes.
……
15. Some plants pounce (catch and feed on) insects.
……
16. The forelimbs of the dolphin are different from the bat's limbs.
……
17. Cooking pots are made from aluminum & their handles are made from wood or plastic.
……

Q3: What is meant by:

1. Melting point:……
2. Boiling point:……
3. Mass number……
4. Atomic number……

Q4: Write the scientific term:

1. The simplest pure form for a substance that could not be analyzed into a simpler form. (……)
2. The smallest part of matter that can exist freely and carries the properties of matter. (……)
3. The smallest part of matter that can take part in chemical reactions without being changed. (……)
4. The product from the combination of atoms of different elements. (……)
5. The spaces that are found among the molecules. (……)
6. Number of positive protons in the atom nucleus. (……)
7. Sum of protons and neutrons in a nucleus. (……)
8. Particles that are negatively charged and have negligible mass revolving around the nucleus. (……)
9. Imaginary places in which electrons can move according to their energy. (……)

Q5: Put (√) or (x) in front of the following sentences:

1. Molecules of the same substance are different from each other. ( )
2. The compound consists from similar atoms. ( )

Q6: Complete the table :

P.O.C	Symbol	Number of neutrons	No. of electrons in outermost level	Electronic configuration	Active or inactive
Sodium	$^{23}_{11}Na$				
	$^{14}_{7}N$				
	$^{35}_{17}Cl$				
	$^{4}_{2}He$				
Lithium	$^{7}_{3}Li$				
Neon	$^{20}_{10}Ne$				
	$^{32}_{16}S$				
Aluminum	$^{27}_{13}Al$				

Q7: Choose a phrase from column A which may match another from column B:

A	B
1.The unit of density	Atomic number
2.The number of positive protons in the nucleus	cm^3

3.Substances that conducts heat and electricity.	Mass number
4.The unit of mass	Copper and iron
5.The sum of the number of protons and neutrons	g
6.Bad conductors of heat and electricity.	g/cm^3
7.The unit of volume	Wood and plastic

Q8: Compare between the states of matter :

P.O.C	Solid	Liquid	gas
Intermolecular force			
Intermolecular distance			
Intermolecular motion			
Shape and volume			
An example			

Q9: Choose the correct answer:

1. The permanent resource of energy is ……..
   A. Petrol B. Sun
   C. Nuclear energy D. Coal
2. Mechanical energy is the sum of …… energies.
   A. potential and heat B. light and kinetic
   C. potential and kinetic D. potential and light
3. An object of 20 Newton weight is placed at 5m height, its potential energy = ……
   A. 150 J B. 150 Newton
   C. 100 J D. 100 Newton
4. An object of mass 2 Kg is moving at speed of 4m/s. The kinetic energy of this object = ……
   A. 50 J B. 150 J
   C. 100 J D. 200 J
5. Chemical energy can be stored in……..

A. car battery B. stretched spring

C. raising a load up D. car lamp

6. Electric energy is converted into kinetic energy in……..
A. electric lamp B. cellular phone

C. electric fan D. electric bell

7. In the solar batteries the solar energy is directly converted into ……. energy
A. kinetic B. light

C. electric D. Sound

8. The scorpion belongs to ……..
A. insects B. myriapods

C. arachnids D. mammals

9. …….. reproduces by spores.
A. pine B. beans

C. vougheir D. wheat

10.…….. are animals without body support
A. reptiles B. snails

C. jelly fish D. cartilaginous fish

11. Cycas belongs to ……..
A. brown algae B. mosses

C. molluscs D. gymnosperms

12. An object potential energy is zero when the object is at the ……..
A. maximum height B. earth's surface

C. when the object mass increases D. when the object speed increases

13. The atom nucleus contains ……..
A. protons and neutrons B. protons and electrons

C. neutrons and electrons D. protons, neutrons and electrons

Q10: What's the difference between each of the following ?

1. Bean and wheat
……
2. Insects and arachnids
……

Q11: Solve the following problems

1. A stone of mass 5 kg falls from 8 m height ,what is its potential energy? what is its kinetic energy? the gravity acceleration = 10 m/s^2

   .....

2. An object is placed at a height of 11 m . Its potential energy = 88 J . Find the object's weight.

   .....

3. An object is moving with a speed = 4 m/s . Its kinetic energy = 46 J Find the mass of this object.

   .....

Q12: What is the energy transformation in the following:

Device or process	Energy used	Energy produced
Solar cell		
Electric heater		
Electric lamp		
Burning of fuel		
Electric fan		
Battery		
Burning of food in the living cell		
Simple cell		

Q13: The figure shown represents the electronic configuration of an atom :

Determine the following:

1. Atomic number of this element.....
2. Mass number of this element.....
3. Number of electrons in the outer level .....
4. Number of energy levels which carry electrons .....

Model answers for the final Revision

Q1: Complete the following:

1. The unit of volume is cm^3 and that of mass is …g..
2. An alloy of gold and copper is used in making jewels while an alloy of nickel and chromium is used in making heater coils.
3. Holders of light bulbs in streets are painted from time to time in order to protect them from rust
4. Some substances conduct heat and electricity such as iron and copper while other substances don't conduct heat nor electricity such as wood and plastic
5. The liquid element which its molecule is made of one atom is mercury
6. The liquid element where each molecule is composed of two atoms is bromine
7. Matter is composed of small units called molecules
8. A hydrogen molecule consists of two atom (s)
9. A molecule of argon(inert gas) consists of one atom (s)
10. Sloth and armadillo are teethless mammals.
11. Arthropods are classified according to the number of legs into insects, arachnids and myriapods.
12. The external shape and the way of reproduction are used in classifying plants.
13. Species is the basic unit of classification of living organisms.
14. Amoeba and paramecium are aquatic micro-organisms.
15. Fern plants reproduce by spores where as Gymnosperms plants reproduce by seeds inside cones.
16. Electric wires are made from copper.
17. The cockroach belongs to insects where as the scorpion belongs to arachnids
18. Energy is the ability to exert work.
19. The symbol of sodium is Na where as the symbol of sulphur is S

Q2: Give reasons:

1. Wood floats on the water surface while a piece of lead sinks.
   because wood is less dense than water so it floats while lead is more dense than water so it sinks .

2. An ice cube changes into liquid water after a period of time.
   because it has low melting point also heat increases the intermolecular distances & therefore the solid becomes liquid.
3. The screwdrivers electricians use are made from steel iron & they have wooden handles.

Because steel is a good conductor of electricity while wood is a bad conductor of electricity.

4. When salt is added to water it disappears.
   because the salt goes into the intermolecular spaces between the water molecules.
5. The volume of a mixture of water and alcohol is less than the sum of their volumes before being mixed together.
   because the alcohol molecules occupy the intermolecular spaces of water .

6. A piece of iron isn't broken by hands.

Because the intermolecular force between the iron molecules is strong.

7. The smell of perfume spreads from an open bottle all over the room.
   The perfume molecules which carry the smell of the perfume spread in the air.
8. The atom is electrically neutral.
   The number of positive protons is equal to the number of negative electrons.
9. The 3rd energy level (M) in the atom is saturated with 18 electrons.
   because by applying the rule $2n^2$, M= third level so $2x(3)^2 = 18$ electrons.
10. The equation $2n^2$ is not applied to levels higher than the 4^{th} level.
    because the atom will be unstable if the energy level carries more than 32 electrons.
11. Neon gas does not react chemically with other substances.
    Because its outer most energy level is completely filled with 8electrons so it is stable and inactive.

12. The front teeth of the hedgehog extend outwards.
    To catch insects.

13. The mule (the offspring from mating between the donkey & horse) isn't fertile .
    because the horse & donkey are two different species.

14. Some birds have long and thin beaks and long legs with thin toes.

They have long thin beaks to pick up worms and snails and long thin legs to help them walk in the water.

15. Some plants pounce (catch and feed on) insects.

To get the nitrogenous compounds they need to make proteins.

16. The forelimbs of the dolphin are different from the bat's limbs.

Forelimbs of dolphin are modified into paddles for swimming while forelimbs of the bat are modified into wings for flying.

17. Cooking pots are made from aluminum & their handles are made from wood or plastic.

Aluminum is good conductor of heat while wood or plastic are bad conductors of heat.

Q3: What is meant by:

1. Melting point is the temperature at which the solid changes into liquid.
2. Boiling point is the temperature at which the liquid changes into gas.
3. Mass number: is the sum of protons and neutrons inside the nucleus.
4. Atomic number: is the number of positive protons inside the nucleus.

Q4: Write the scientific term:

1. The simplest pure form for a substance that could not be analyzed into a simpler form. (Element)
2. The smallest part of matter that can exist freely and carries the properties of matter. (Molecule)
3. The smallest part of matter that can take part in chemical reactions without being changed. (Atom)
4. The product from the combination of atoms of different elements. (Compound)
5. The spaces that are found among the molecules. (Intermolecular spaces)
6. Number of positive protons in the atom nucleus. (Atomic number)
7. Sum of protons and neutrons in a nucleus. (Mass number)
8. Particles that are negatively charged and have negligible mass revolving around the nucleus. (Electrons)
9. Imaginary places in which electrons can move according to their energy. (Energy levels)

Q5: Put (√) or (x) infront of the following sentences:

1. Molecules of the same substance are different from each other. (x)
2. The compound consists from similar atoms. (x)

Q6: Complete the table :

P.O.C	Symbol	Number of neutrons	No. of electrons in outermost level	Electronic configuration	Active or inactive
Sodium	$^{23}_{11}Na$	12	1		active
Nitrogen	$^{14}_{7}N$	7	5		active
Chlorine	$^{35}_{17}Cl$	18	7		active
Helium	$^{4}_{2}He$	2	2		inactive
Lithium	$^{7}_{3}Li$	4	1		active

Neon	20 10 Ne	10	8		inactive
Sulphur	32 16 S	16	6		active
Aluminum	27 13 Al	14	3		active

Q7: Choose a phrase from column A which may match another from column B:

A	B
1.The unit of density	(2) Atomic number
2.The number of positive protons in the nucleus	(7) cm^3
3.Substances that conduct heat and electricity.	(5) Mass number
4.The unit of mass	(3) Copper and iron
5.The sum of the number of protons and neutrons	(4) g
6.Bad conductors of heat and electricity.	(1) g/cm^3
7.The unit of volume	(6) Wood and plastic

Q8: Compare between the states of matter :

P.O.C	Solid	Liquid	gas
Intermolecular force	Very strong	Weak	Very weak
Intermolecular distance	tiny	bigger than solids	very large
Intermolecular motion	Limited	More free	Completely free
Shape and volume	Definite shape Definite volume	Indefinite shape Definite volume	Indefinite shape Indefinite volume
An example	Iron	Water	oxygen

Q9: Choose the correct answer:

1. The permanent resource of energy is ……..
   A. Petrol B. The sun

C. Nuclear energy D. Coal

2. Mechanical energy is the sum of …… energies.

A. potential and heat B. light and kinetic

C. potential and kinetic D. potential and light

3. An object of 20 Newton weight is placed at 5m height, its potential energy = ……

A. 150 J B. 150 Newton

C. 100 J D. 100 Newton

4. An object of mass 2 Kg is moving at speed of 4m/s. The kinetic energy of this object = ……

A. 16 J B. 150 J

C. 100 J D. 200 J

5. Chemical energy can be stored in……..

A. car battery B. stretched spring

C. raising a load up D. car lamp

6. Electric energy is converted into kinetic energy in…….

A. electric lamp B. cellular phone

C. electric fan D. electric bell

7. In the solar batteries the solar energy is directly converted into ……. energy

A. kinetic B. light

C. electric D. Sound

8. The scorpion belongs to ……

A. insects B. myriapods

C. arachnids D. mammals

9. …… reproduces by spores.

A. pine B. beans

C. vougheir D. wheat

10. …… are animals without body support

A. reptiles B. snails

C. jelly fish D. cartilaginous fish

11. Cycas belongs to ……

A. brown algae B. mosses

C. molluscs D. gymnosperms

12. An object potential energy is zero when the object is at the ……

A. maximum height B. earth's surface

C. when the object mass increases D. when the object speed increases

13. The atom nucleus contains ……

A. protons and neutrons B. protons and electrons

C. neutrons and electrons D. protons, neutrons and electrons

Q10: What's the difference between each of the following ?

Bean	**wheat**
Dicotyledon seed	Monocotyledon seed

Insects	Arachnids
Have 3 pairs of jointed legs. (ex.fly)	Have 4 pairs of jointed legs (ex.Spider)

.Q11: Solve the following problems

1. A stone of mass 5 kg falls from 8 m height ,what is its potential energy? the gravity acceleration = 10 m/s^2
   Potential energy = Weight x Height
   (Weight = Mass x Gravity acceleration)

   = 5 x 10 = 50 N

   Potential energy = 50 X 8 =400 J

2. An object is placed at a height of 11 m . Its potential energy = 88 J . Find the object's weight.
   Potential energy = Weight x Height
   weight = potential energy / height

   =88 / 11 = 8 N

3. An object is moving with a speed = 4 m/s . Its kinetic energy = 46 J Find the mass of this object.
   Kinetic energy = 1/2 x Mass x $(Velocity)^2$

   $46 = 1/2 \times Mass \times (4)^2$

   Mass = 5.75 g

Q12: What is the energy transformation in the following:

Device or process	Energy used	Energy produced
Solar cell	Solar energy	Electric energy
Electric heater	Electric energy	Heat energy
Electric lamp	Electric energy	Light energy
Burning of fuel	Chemical energy	Heat energy
Electric fan	Electric energy	Kinetic energy
Battery	Chemical energy	Electric energy
Burning of food in the living cell	Chemical energy	Heat energy
Simple cell	Chemical energy	Electric energy

Q12: The figure shown represents the electronic configuration of an atom :

1. Atomic number of this element = 17
2. Mass number of this element = 35
3. Number of electrons in the outer level = 7
4. Number of energy levels which carry electrons = 3
5. active or inactive element = active

Questions

Unit (1)

(1) Give reasons for each of the following:

1- Equal masses of different substances have different volumes.
or Equal volumes of different substances have different masses.

2- The iron nail and the metallic coin sink in water while the piece of wood floats on the water surface.

3- Water is not used to extinguish petrol fires.

4- Balloons filled with hydrogen or helium rise up in air carrying flags.

5- Melting point is used to separate between different substances.

6- Electric wires are made of copper or aluminium.

7- Screw driver are made of steel, while their handles are made of wood or plastic.

8- Cooking pans are made of aluminium.

9- Handles of cooking pans are made of wood or plastic.

10- Sodium and potassium are kept under kerosene surface.

11- Steel bridges and the holders of light bulb are painted from time to time.
- Metallic spare parts of cars are covered with grease.

12- Washing of cooking pans made of aluminium with a rough material.

13- Silver and gold are used in making jewels.

14- Nickel, gold and silver are used to cover other substances which rapidly gain rust.

15- When you leave the perfume bottle opened, you smell it all over the room.

16- A drop of ink spreads through water.

17- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

18- It is difficult to break an iron piece with your hand.

19- The atom is electrically neutral in its ordinary state.

20- The mass of the atom is concentrated in the nucleus.

21- The nucleus is positively charged.

22- Nobel gases don't enter a chemical reaction through ordinary conditions.

(2) What' meant by:

1- Density

2- Melting point

3- Molecule

4- Intermolecular spaces

5- Intermolecular force

6- Latent heat of melting

7- Element

8- Compound

9- Atom

10- Atomic number

11- Mass number

12- Energy levels

13- Quantum of energy

14- The excited atom

(3) Problem

1- What is the density of 35 gm of a substance that occupy 25 cm^3

2- In an experiment to determine the density of water, the following results were recorded.

- Mass of an empty beaker = 65 gm.
- Mass of the beaker and water = 165 gm
- The volume of water = 100 cm^3.

Calculate the density of water.

(4) Show the electronic configuration of the following elements:

$^{20}_{10}Ne$, $^{24}_{12}Mg$, $^{40}_{20}Ca$, $^{17}_{9}F$

Unit (2)

(1) Give reason for each of the following:

1- The fuel inside the car is similar to the food inside the body of the living organisms.

2- The developed countries aim to use solar energy, wind energy and the movement of water more than before.

3- The weight of an object is different from its mass.

4- The kinetic energy will increase four times as the velocity of the moving object is doubled.

5- In the simple pendulum, the kinetic energy of the vibrating body is maximum when it passes its original position during its movement.

6- When the ball of pendulum reaches the maximum height the potential energy equals the mechanical energy.

7- Car engine is important to the car.

8- The freezer of the fridge is found at the top of the fridge.
- The air conditioner is fixed at the upper part of room.

9- The electric heater is placed at the bottom of the room.

10- The heat of the sun doesn't reach to the Earth by conduction or convection.

11- The production of electricity from solar energy is preferred to that which produced from burning of fuel.

12- You feel hot when you touch a hot metallic spoon.

(2) What's meant by:

1) Energy
2) The mechanical energy
3) Potential energy
4) Kinetic energy
5) The conservation law of mechanical energy
6) The conservation law of energy
7) Heat energy
8) The temperature
9) conduction
10) convection
11) radiation

Important Laws:

1) Work (w) = Force (f) × Displacement (d)
2) Weight = mass × Acceleration of gravity
3) potential energy (P.E) = weight (w) × height (h)
4) Kinetic energy (k.E) = $\frac{1}{2}$ mass (m) × (velocity)^2 $(v)^2$

Important units:

1) Work → Joule
2) force → Newton
3) Displacement → metre
4) weight → Newton
5) mass → k.g
6) Acceleration of gravity → Newton
   $\simeq$ 9.8 = 10 k.g
7) P.E → Joule
8) Height → meter

9) K.E → Joule

10) velocity → m/sec

Energy transformation:

Technological application	Energy transformations
1- simple cell	Chemical energy → electric energy
2- Electric Lamp	Electric energy → light & heat energy
3- Car engine	a) chemical energy (stored in fuel changes by burning) → thermal energy b) thermal energy → mechanical energy
4- car dynamo	Mechanical energy → electric energy
5- car lamps	Electric energy → light energy
6- car radio	Electric energy → sound energy
7- Electric heater of car (air conditioner)	Electric energy → heat energy
8- sewing machine	Electric energy → mechanical (kinetic energy)
9- solar cell on solar battery	Solar energy → electric energy
10- television	Electric energy → light & sound energy
11- Alarm clock	Chemical energy (stored in battery) Kinetic & sound energy
12- cellular phone	Electromagnetic waves → sound energy
13- solar heater	Solar energy → heat energy
14- solar oven	
15- solar furnace	

Unit (3)

(1) Give reasons for:

1- We can distinguish between banana plant and Molukhiah plant.

2- Cycas is a gymnosperm plant.

3- The front teeth of hedgehog are extending out wards.

4- The diversity of living organisms.

5- Horse's limbs end in a strong solid hoof.

6- Bird migration is a behavioural adaptation.

7- Beaks and legs of birds are modified in many different ways.

8- Insectivorous plants cannot make proteins by themselves.

9- The legs of predatory birds have three anterior fingers and posterior one.

10- Dinosaurs and mammoth had been perished.

11- Some animals hibernate in winter.

12- Elodea roots are weak where it's leaves are neckless.

13- Elodea stem has air chambers inside it.

14- Calamagrostis roots extend vertically for long distance in the soil.

15- Opuntia leaves are reduced into spines.

- Leaves of some desert plants are surrounded by waxy layer.

- Leaves of calamagrostis plant are spiraled and contain a few numbers of stomata.

16- Leaf – insect is hardly to be discovered by its enemies.

17- The camel is considered as the desert ship.

18- Camel's upper lip is forked and its enamel teeth is strong.

19- Camel's fur thickness differs at the different body regions.

20- The camel has no need for sweating.

21- The camel stores fats in its hump.

22- The camel can be alive for 3 – 4 months without eating any food.

(2) Define (Scientific term):

1- Micro – organisms

2- Gymnosperms

3- Angiosperms (flowering plants)

4- Arthropods

5- Arachnids

6- Myriapods

7- Rodents

8- Lagomorphs

9- Taxonomy

10- Species

11- Adaptation

12- Structural adaptation (Anatomical)

13- Functional adaptation

14- Behavioural adaptation

15- Predacious plants (insectivorous)

16- camouflage

Model Answers

Unit (1)

(1) Give reasons for each of the following:

1- Equal masses of different substances have different volumes.

or Equal volumes of different substances have different masses.

Because they have different densities.

2- The iron nail and the metallic coin sink in water while the piece of wood floats on the water surface.

Because coin and nail have density higher than water while piece of wood has density lower than water.

3- Water is not used to extinguish petrol fires.

Because the density of petrol is less than that of water so, petrol floats on water surface and doesn't put out the fire.

4- Ballons filled with hydrogen or helium rise up in air carrying flags.

Because the densities of hydrogen and helium are less than the density of air.

5- Melting point is used to separate between different substance.

Because each substance has a definite melting point which differs from the others.

6- Electric wires are made of copper or aluminium.

Because they are good conductors of electricity.

7- Screw driver are made of steel, while their handles are made of wood or plastic.

Because steel is a good conductor of electricity but wood and plastic are bad conductors of electricity.

8- Cooking pans are made of aluminium.

Because it is a good conductor of heat and it has a high melting point and it is easy to transfer heat.

9- Handles of cooking pans are made of wood or plastic.

Because wood and plastic are bad conductors of heat.

10- Sodium and potassium are kept under kerosene surface.

To prevent their reaction with atmospheric oxygen as they are active metals.

11- Steel bridges and the holders of light bulb are painted from time to time.

- Metallic spare parts of cars are covered with grease.

To protect them from rust and corrosion.

12- washing of cooking pans made of aluminium with a rough material.

To remove any layer formed on them.

13- Silver and gold are used in making jewels.

Because they are chemically poor active.

14- Nickel, gold and silver are used to cover other substances which rapidly gain rust.

To protect them from rust and corrosion.

15- When you leave the perfume bottle opened, you smell it all over the room.

Because the molecules of the perfume are in continous motion and they keep the properties of perfume.

16- A drop of ink spreads through water.

Because the molecules of ink are in a continuous motion in all directions among water molecules.

17- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

Because some molecules of alcohol occupy the intermolecular spaces among water molecules.

18- It is difficult to break an iron piece with your hand.

Because there are strong attraction force (intermolecular force) among iron molecules.

19- The atom is electrically neutral in its ordinary state.

Because the number of positive protons inside the nucleus is equal the number of negative electrons which revolve around it.

20- The mass of the atom is concentrated in the nucleus.

Because the electron has a negligible mass relative to that of proton or neutron.

21- The nucleus is positively charged.

Because it contains protons that positively charged particles and neutrons that electrically neutral particles.

22- Nobel gases don't enter a chemical reaction through ordinary conditions.

Because the outermost energy levels of their atoms are completely filled with electrons.

(2) What' meant by:

1- Density :

It is the mass of unit volume of matter. D = $\frac{m}{v}$

2- Melting point:

It is the temperature at which matter begins to change from a solid state to a liquid state.

3- Molecule:

It is the smallest part of matter which can exist freely and it has the properties of matter.

4- Intermolecular spaces:

They are the spaces that found among the molecules.

5- Intermolecular force:

It is the force that bounds the molecules together.

6- Latent heat of melting:

It is the amount of heat required to change 1 kg. of substance from solid state to the liquid state without changing in the temperature [although heating is continued]

7- Element:

It is the simplest pure form of matter which can't be analyzed chemically into simple form & it composed of similar atoms.

8- Compound:

It is a substance which is formed from combination of atoms of two or more different elements with constant weight ratios.

9- Atom:

- It is the fundamental building unit of matter
- It is the smallest individual unit of matter which can share in chemical reaction.

10- Atomic number:

It is the number of protons in the nucleus of an atom and = number of electrons.

11- Mass number:

It is the sum of the numbers of protons and neutrons in the nucleus of an atom.

12- Energy levels:

They are imaginary regions around the nucleus in which the electrons move according to their energies.

13- Quantum of energy:

It is the amount of energy lost or gained by an electron when it transfers from one energy level to another.

14- The excited atom:

It is the atom that gains a quantum of energy.

(3) Problem

1- What is the density of 35 gm. of a substance that occupy 25 cm^3

$D = \frac{m}{v}$ $\quad m = 35$ gm

$V = 25\ cm^3$

$\therefore D = \frac{35}{25} = 1.4\ gm/cm^3$

2- Mass of water = 165 – 65 = 100 gm

$D = \frac{m}{v} = \frac{100}{100}$

$D = 1\ gm / cm^3$

(4) Show the electronic configuration of the following elements:

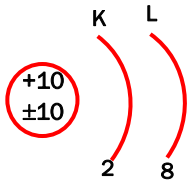
$^{20}_{10}Ne$, $^{24}_{12}Mg$, $^{40}_{20}Ca$, $_{9}F$

$^{20}_{10}Ne$

no. protons → 10

no. neutrons → 10

no. electrons → 10



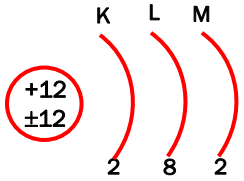
nobel gas

$^{24}_{12}Mg$

no. protons → 12

no. neutrons → 12

no. electrons → 12



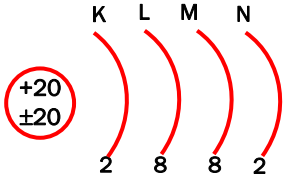
metal

$^{40}_{20}Ca$

no. protons → 20

no. neutrons → 20

no. electrons → 20



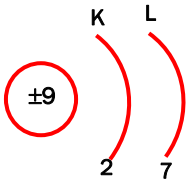
metal

$^{17}_{9}F$

no. protons → 9

no. neutrons → 8

no. electrons → 9



non metal

Unit (2)

(1) Give reason for each of the following:

1- The fuel inside the car is similar to the food inside the body of the living organisms.

Because burning each of them produce energy which makes the car move and living organism do work.

2- The developed countries aim to use solar energy, wind energy and the movement of water more than before.

Because they are cheap resources of energy and do not pollute the environment.

3- The weight of an object is different from its mass.

Because the weight = mass × acceleration of gravity.

4- The kinetic energy will increase four times as the velocity of the moving object is doubled.

Because kinetic energy is directly proportional to the square of velocity. K.E α v^2

5- In the simple pendulum, the kinetic energy of the vibrating body is maximum when it passes its original position during its movement.

Because when the pendulum passes its original position, its velocity is maximum.

6- When the ball of pendulum reaches the maximum height the potential energy equals the mechnical energy.

Because when the ball reaches the maximum height its velocity is zero so the kinetic energy is zero.

7- Car engine is important to the car.

Because the chemical energy stored in the fuel changes by burning into thermal energy and thermal energy changes into mechanical energy (to move the car).

8- The freezer of the fridge is found at the top of the fridge.

- The air conditioner is fixed at the upper part of room.

Because, when the air is cooled, its density increase so it, falls down to cool the room or (to cool the food in the refrigerator), while the hot air (of low density) rises up to be cooled again and so on.

9- The electric heater is placed at the bottom of the room.

When the air (around the heater) is heated, its density decreases so, it rises up to warm the room, while the cold air of high density falls down to be heated again and so on.

10- The heat of the sun doesn't reach to the Earth by conduction or convection.

It is not transferred by conduction, because air is a bad conductor for heat and it is not transferred by convection because the space between the sun and the atmosphere of the earth does not contain any medium through which heat could be transferred.

11- The production of electricity from solar energy is preferred to that which produced from burning of fuel.

Because solar energy is a clean source of energy which doesn't pollute the environment and it is a permanent source of energy.

12- You feel hot when you touch a hot metallic spoon.

Due to the transfer of heat of object of high temperature (metallic spoon) to the object of low temperature (you) and the metallic spoon is a good conductor of heat.

(2) What's meant by:

1) Energy

It is the ability to do work or to make a change.

2) The mechanical energy:

It is the summation of potential and kinetic energies of the body.

3) Potential energy:

It is the stored energy in the object due to a work done on it.

4) Kinetic energy:

It is the work done during the motion of an object or it is the energy of the moving body.

5) The conservation law of mechanical energy:

The sum of potential and kinetic energies of an object under the effect of gravity is a constant value.

6) The conservation law of energy:

Energy is neither created nor destroyed, but it is converted from one form to another.

7) Heat energy:

It is a form of energy which transfers from the object of higher temperature to that of lower one.

8) The temperature:

It is the condition which states the direction of heat energy whether from or to the object when it comes in contact with another and it is directly proportional the particles kinetic energy.

9) conduction

It is the transfer of heat through solids from the part of higher temperature to the part of lower temperature.

10) Convection

It is the transfer of heat in gases and liquids, where hot molecules have less density and rise up wards, while colder molecules have more density, and fall down.

11) Radiation

It is the transfer of heat from hot object to another without any need for a material medium through which heat transfers in different directions.

Unit (3)

(1) Give reasons for:

1- We can distinguish between banana plant and Molukhiah plant.

Because banana plant carry large sized leaf while the molukhiyah plant carry small sized leaf.

2- Cycas is a gymnosperm plant.

Because its seed is formed inside cones and not inside a pericarp (fruit envelope).

3- The front teeth of hedgehog are extending out wards.

To capture insects.

4- The diversity of living organisms.

To adapt with the environmental changes such as climate change, food diversity and existence of water.

5- Horse's limbs end in a strong solid hoof.

To help the horse go through the rocky soil.

6- Bird migration is a behavioural adaptation.

Because it is an adaptation in the activity of some animals in different times of the day light.

7- Beaks and legs of birds are modified in many different ways.

Because long thin beaks to pick up worms and snails while the legs long thin legs ending in thin fingers to walk in the existence of water.

8- Insectivorous plants cannot make proteins by themselves.

Because they can't absorb the nitrogenous substances needed to make proteins from the soil.

9- The legs of predatory birds have three anterior fingers and posterior one.

Three anterior and one posterior to firm pouncing the prey.

10- Dinosaurs and mammoth had been perished.

Because they couldn't be adapted to the environmental changes.

11- Some animals hibernate in winter.

Due to the decrease of temperature.

12- Elodea roots are weak where it's leaves are neckless.

Because they are not needed to fix the plant or absorb water and their leaves are neckless, so their connection with the stem will be stronger.

13- Elodea stem has air chambers inside it.

To store an amount of oxygen gas produced during photosynthesis process to be used in respiration.

14- Calamagrostis roots extend vertically for long distance in the soil.

To reach the humid layers of soil to absord ground water.

15- Opuntia leaves are reduced into spines.

- Leaves of some desert plants are surrounded by waxy layer.
- Leaves of calamagrostis plant are spiraled and contain a few numbers of stomata.

To prevent or (reduce) water loss by transpiration.

16- Leaf – insect is hardly to be discovered by its enemies.

Because it looks the plant leaf exactly in its colour and shape of wings.

17- The camel is considered as the desert ship.

Because it has the ability to store food and water that help it to travel for long distances without drinking or eating.

18- Camel's upper lip is forked and its enamel teeth is strong.

To enable it to eat the spiny and dry desert plants without harming it.

19- Camel's fur thickness differs at the different body regions.

It is more dense at the vital body regions to provide protection from the extreme cold at night and little dense over other body regions to ease heat loss by radiation during day light.

20- The camel has no need for sweating.

Because the blood temperature is not constant and it changes from 34° c in the morning to 41° c during the day light hours.

21- The camel stores fats in its hump.

To keep it for 3 – 4 months without eating any food.

22- The camel can be alive for 3 – 4 months without eating any food.

Because it store fats in its hump end can lose 25% of its body weight when water and food are not available and its blood composition remains constant.

(2) Define (Scientific term):

1- Micro – organisms

They are living organisms that cannot be seen by naked eye, but they spread everywhere around us, in air water and soil.

2- Gymnosperms

They are plants, their seeds are formed inside cones and not inside a pericarp (fruit envelope)

3- Angiosperms (flowering plants)

They are plant, their seeds are formed inside apericarp.

4- Arthropods:

They are invertebrate animals that are characterized by the presence of jointed legs.

5- Arachnids:

Arthuropods that have four pairs of legs. Ex (spiders, scorpions)

6- Myriapods:

Arthropods that have numerous legs. Ex: scolopendra, Julius.

7- Rodents:

They are mammals have one pair of incisors in each jaw.

8- Lagomorphs:

They are mammals have two pairs of incisors in the upper jaw and one pair in the lower jaw.

9- Taxonomy:

It is a branch of biology that searches for the similarities and the differences among living organisms and it places the similar ones in groups according to a certain system in order to ease their study.

10- Species:

It is a group of more similar living organisms in shape that can reproduce to give birth of new fertile individuals which are able to reproduce and keeping the existence of the species.

11- Adaptation:

It is a modification of living organism's behavior, body structure or organs biological functions to become more adapted to the environmental conditions which it lives in.

12- Structural adaptation (Anatomical):

It is an adaptation that studies the structure of one body organ.

13- Functional adaptation:

It is an adaptation of some organs and tissues to do a specific function.

14- Behavioural adaptation:

It is an adaptation in the activity of some animals in different times of the day light.

15- Predacious plants (insectivorous)

They are self feeding (auto trophic) green plants because they can perform photosynthesis process so, they can make carbohydrates and can't make proteins.

16- camouflage:

It is the ability of some living organisms to be hidden from their enemies or to capture the preys in the predatory species.

Revision

Density

It is the mass of unit volume of matter Or It is the mass of one cubic centimeter

Density unit (gm/cm^3)

Melting point: ***It is the temperature substance changes from solid state to liquid state.***

Low melting points	***High melting points***
Wax - butter and ice	Iron, copper, aluminum and table salt.

Gold-copper alloy ***used in making jewels***

Nickel- chrome alloy ***used in making heating coils.***

Stainless steel alloy ***used in making cooking pots.***

Boiling poin:t ***It is the temperature substance changes from liquid state to gaseous state.***

Hardness

soft solid at ordinary temperatures	substance need heat to become soften	solids substance can't be soften by heating
rubber	**Metals**	**Coal and sulphur**

Electric conduction

Good electric conductors	***Bad electric conductors***
1-Metals(copper-Iron-silver) *2-Acid and alkali solutions* *3- Salts solutions*	*1-Gases –sugar solution,-* *2-solution of hydrogen chloride in benzene* *3-sulphur and phosphorus*

Thermal conduction

Good Thermal conductors	***Bad Thermal conductors***
Metals(copper-Iron-aluminum)	*Wood and plastic*

very active metals	***less active metals***	***Inactive metals***
Potassium and sodium	***Iron, Aluminum and Copper***	***Silver, Platinum and gold***
They react with oxygen as soon as being exposed to humid air	*They react with oxygen if left in air for some days*	*They don't react with oxygen used in making jewels and used to cover other substances*

♣The molecule ♣

It is the smallest part of matter which can exist free and keep the properties of matte

****** A drop of ink spreads through water??***
Because the molecules in a state of continuous motion

The volume of mixture of water and alcohol is less than the sum of their volume?
Because alcohol occupy molecules fill space in water molecules.

Comparison between Solids, Liquids and Gaseous

Points	***Solids***	***Liquids***	***Gaseous***
The motion of molecules	***Oscillatory motion***	***Limited***	***free***
intermolecular spaces	***(very small)***	***large***	***Very large***
intermolecular forces	***very strong***	***weak***	***very Weak***
The volume	***definite***	***definite***	***Indefinite***
The shape	***definite***	***indefinite***	***Indefinite***

Melting **It is Change of matter from solid state to liquid state by heating**

Vaporization **It is Change of matter from liquid state to gaseous state by heating**

Atom ***It is the fundamental building unit of matter***

The element ***simplest pure form of matter which can't be analyzed into simpler form***

Element molecules are formed of similar atoms

Liquid elements	Gaseous elements
Mercury liquid elementof **one atom** **Bromine** liquid element **two atoms**	**1-one atom** as **noble gases** Helium- Neon-Argon **2-two atoms** as **Active gases** Hydrogen-Oxygen - Nitrogen-Chlorine

The compound combination of two or more different elements with constant weight ratio .

Examples of some compounds

1- Water H_2O	2- Sodium Chloride Na Cl	3 – Ammonia NH_3

Point of comparison	Element	Compound
Definition	substance molecules consist of similar atom	substance molecules consist of different atoms
Atoms	Similar	Different
examples	Hydrogen, Oxygen, Aluminum and sulphur	Water, Carbon dioxide, Sodium chloride

The atom **It is the fundamental building of matter**

It is smallest part of matter can share in chemical reaction

The element	Symbol	The element	Symbol
Lithium	**Li**	Oxygen	**O**
Sodium	**Na**	Calcium	**Ca**
Potassium	**K**	Magnesium	**Mg**
Hydrogen	**H**	Zinc	**Z**
Silver	**Ag**	Load	**Pb**
Fluorine	**F**	Aluminum	**Al**
Chlorine	**Cl**	Silicon	**Si**
Bromine	**Br**	Copper	**Cu**
Gold	**Au**	Mercury	**Hg**
Helium	**He**	Iron	**Fe**
Sulphur	**S**	Carbon	**C**

Point of comparison	• **Proton**	• **Neutron**	• **Electron**
• **1-position**	• In the nucleus	• In the nucleus	• Around the nucleus
• **2- charge**	• positive(+ve)	• neutral (±ve)	• negative (-ve)
• **3 Mass**	• large	• large	• Very small

The atomic number **it is the number of positive protons in the nucleus**

The mass number **it is the sum number of Protons and neutrons in the nucleus**

Energy levels **imaginary places in which electrons move according to their energy**

The maximum number of energy levels is 7(seven) levels

- Number of electrons in energy level calculated from the **relation ($2n^2$)**

Quantum ***amount of energy gained or lost by electron to transfer from energy level to another***

The excited atom ***It is the atom that gains quantum of energy.***

The chemical activity determine by the number of electrons in the outer level

	Active elements	Inactive elements
The no. of electrons in outer level	Less than 8 electrons	Completely filled (He) contains 2 electrons
The activity	Active elements (unstable)	Inactive elements (stable)
Chemical reaction	Share in chemical reaction	Can't share in chemical reaction
Example	Sodium – Chlorine - Oxygen	Noble gaseous

Work It is a force acts on a body to move it a distance in dirction of force.

Work (joule) = force (newton) × displacement (metre) $W = F \times d$

Energy **It is the ability to do work or to make change.**

Mechanical energy **It is the sum of potential and kinetic energies of the body.**

Potential energy **It is the stored energy in the object due to work done on it.**

Factors affecting potential energy	
Weight	Height
P.E increases by increasing weight.	P.E increases by increasing height.
Potential energy (joule) = weight (N) × height (m)	

Kinetic energy **It is the work done during the motion of an object.**

Factors affecting the kinetic energy	
Speed of object	Mass of object
K.E increases by increasing speed.	K.E increases by increasing mass.
Kinetic energy = 1/2 mass × square velocity $K.E = 1/2\ m \times V^2$	

P. E is maximum at the hightest point. P. E = zero at the ground.

K.E is maximum at ground. K.E = zero at the maxmum height.

The Conservation law of energy

Energy is neither created nor destroyed, but it is converted from one form to another.

1 – Energy transformation in the simple cell:

Chemical energy change into electric energy.

Energy transformation inside the car:

Car parts	Changes of energy
car engine	Chemical energy into heat energy. - Heat energy changes into mechanical energy
The electric generator (dynamo)	- mechanical energy change into electric energy
in the heater of the air condition	- the electric energy is converted into heat energy

Examples of some technological applications in our life

Application	Energy changes
Sewing machine	It converts electric energy into mechanical (kinetic) energy .
Solar battery cell	It converts solar energy into electric energy.
A Cellular phone – T.V	It converts electric energy into light and sound energy.
Alarm clock	It converts chemical energy into kintic and sound energy.

The negative effects of technology

Wars and killing * Massive destruction

Noise pollution - Chemical pollution

Technological application	Negative effects.
1 – Car exhaust	Cause chemical pollution causes chest and eye diseases.
2 – Military explosions	cause death.
3- Chemical pesticides	Cause chemical pollution for soil, water and air - cancer.
4 –Nuclear weapons	Cause massive destruction.
5 – Cellular phones.	Cause electromagnetic pollution.

Friction : ***converting the kinetic energy into heat energy.***

Heat energy: **form of energy transfer from higher temperature to a lower one.**

Temperature: **condition which states direction of heat whether from or to object.**

Heat transfers by conduction **heat transfers through solids.**

Heat transfers by convection **heat transfer in gases and liquids**

hot molecules have less density move up - cold molecules have more density move down

Heat transfers by radiation

heat transfers from hot object to another ***without need material medium***

The heat of the sun is transferred to us by radiation.

The heat is transferred from the heater (light source) by convection and radiation.

- *The solar energy ((a permanent resource of energy))*
- *The petrol ((" non-renewable " resource of energy))*
- *The electricity is renewable resource of energy.*

Technological applications which depend on the heat energy.

The device	Source of energy	energy resource	Effect on environment.
Electric heater	Electricity	Renewable	Non-polluted
Solar heater	The sun	Permanent	Non- polluted
Electric stove	Electricity	Renewable	Non-polluted
Gas or petrol stove	Petroleum	Non-renewabel	Polluted
Gas oven	Natural gas	Non-renewable	Polluted
Coal fire	Coal	Non-renewable	Polluted.

Application which use the solar energy

Technological aplication	Energy transformations
Solar cells - solar battery	Solar energy changes into electric energy
soalr heater - solar oven - solar furnace	Solar energy changes into heat energy.

Solar energy is important: *B. is main source of most energies on Earth*

1 – In plants ((photosynthesis process)).

2 – Solar energy stored as chemical energy in fuel and petroleum oil.

We prefer to produce electricity from solar energy? B. it is a clean source of energy.

In the animal world

	big animals	small animals	animals live in water	animals live on land
such as	The elephant, and rhinoceros	the rabbit, rat and lizard	fish, crocodile and hippo	horse, lion and dog

In the Plants world

	huge trees	short weeds	plants carry large - sized leaves	plants carry small - sized leaves
such as	camphor and palms	clover and gargeer	banana plants	molukhiyah

Micro-organisms living organisms can't be seen by naked eye.

Micro-organisms lives in pond water

Micro-organisms **are unicellular organisms such as Amoeba, Euglena and Paramecium**

1 : Classifying plants according to the Shape

Some plants can't be distinguished into roots, stems and leaves	plants can be distinguished into roots, stems and leaves
such as the green, Red and brown algae	such as corn, wheat, palms and plants.

Plants reproduce by formation of spores	Plants reproduce by the formation of seeds They are divided into	
Voughair and Adiantum ferns small terrestial plants	Gymnosperms	Angiosperms (Flowering plants)
	The seeds are formed inside cones such as Pine plants and Cycas	they are divided into:

Monocotyledon plants	Dicotyledon plants
such as maize and wheat plants	such as beans and pea plants

Soft bodies	Supported bodies	
Such as jelly fish, octopus, worms doesn't have a support	Animals with external support	Animal with internal support
	such as mussels and snails	such as - fish, reptiles, - birds and mammals

Arthropods invertebrate animals that characterized by jointed legs.

Arthropods	such as	Number of legs
1 - Insects	Fly- bee- Ant	three pairs of joint legs
2 -Arachnids	Spider/ Scorpion	four pairs of joint legs
3 -Myriapods	Scolopendra / Julius	Numerous no. of joint lrgs.

(Teethless mammals	Mammals having teeth			
Such as sloth and armadillo	According to the shape and type, these mammals are divided into:			
	Animals have front teeth	Animals have canines and molars	Animals have sharp incisor.	
	such as hedgehog to capture the insects  Hedgehog	such as lion and tiger	Rodents: • have one pair of incisors in each jaw such as rat and squirrel.  Squirrel	Lagomorphs: • have two pairs of incisors in upper jaw and only one pair in the lower jaw such as the rabbit.  Rabbit

Taxonomy branch of biology search similarities and differences among living organisms

«Species» is the basic classification unit for living organisms

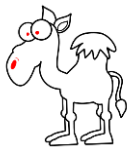
Species:

group of more similar living organisms can rproduce to give birth of new fertile individuals.

Adaptation

modification of living organism's behavior, body structure or organs functions.

to become more adapted to the environmental conditions .

Types of Adaptation					
Structural		functional		behavioural	
Horse hoof	Camel pad	Secreting sweat in human.	Secreting poison in snakes.	Birds migration	Activity of birds in daylight and bats at night
					

Reasons of adaptation

Get food / escape form their enemies.

First : Adaptation and motion in mammals

The mammals	Modification in limb	Reason	Modification type
Whale - Dolphin	Paddles fin like structure.	Swimming and diving.	structural
Bats	Wing like structure	flying	structural
Horse	Strong hoof	Running on rocky soil.	structrual
Monkey	Elongated fingers	To climb trees and catch things.	structrual

Second: Adaptation and nature of food in birds

Describation	Modification	Adaptation type
Feed on meat - flesh e.g. vultures – hawk	Beaks: strong and sharp Legs: four fingers - strong and sharp claws.	structural
Feed on worms and snails e.g. Heron - Hoopoe	Beak; long thing Legs: long thin	structural
Feed on mosses and fish e.g. ducks and geese	Beaks: wide indented Legs: palm	Structural

Third : adaptation in insectivorous plants

They are self-feeding plants , they can perform photosynthesis
They can't make proteins, they can't absorb nitrogenous substances from soil.
Some part of the plant adapted to capture and digest insects to get nitrogenous material.
Examples: Drosera – Dinoea – Halophila

Hibernation

In winter, when temperature decrease, some animals hide in burrows e.g. **frog** and some **insects to overcome low temperature**

Aestivation

In summer, extreme rise in temperature and shortage in water and rain, certain animals (**jerboa – desert snails**) become hide in humid burrows **to overcome high temperature**

Birds migration

In winter, some birds migrate from cold regions to warmer regions **for reproduction**.
These types is behavioral adaptation

Camouflage

It is the ability of some living organisms to be hidden from their enemies or to capture preys in the predatory species.

Adaptation for hiding

Leaf insect	It looks like plant leaf
Stick insect	Looks like brances of plant
Chameleon	It colours itself with dominant colours of environment.

Exercises 1

Question 1:

Complete the following sentences:

1. Electric wires are made up of ..... or .....
2. An object potential energy increases ..... of its weight.
3. If the speed of an object motion increases into the double, its kinetic energy increases into .....
4. Bridges made up of iron are coated in the purporse of protecting them from .....
5. The cockroach belongs to ..... whereas the scorpion belongs to ..... and they are classified as ..... animals.
6. When you examine a pond water drop by a microscope, some micro-organisms can be seen such as ..... and .....
7. ..... energy is changed into electric energy in the battery.
8. Energy is the ability to exert .....
9. Sodium symbol is ..... whereas sulphur symbol is .....

Question 2:

Choose the correct answer to complete the following sentences:

1. Cycas belongs to .....
   A. brown algae. B. mosses.
   C. mollusks. D. gymnosperms.
2. ..... is known as the number of protons and neutrons existed in an atom nucleus of an element.
   A. Mass number. B. Density.
   C. Atomic number. D. Valence.
3. In rodents, the incisors number in the lower jaw are .....
   A. one pair. B. two pairs.
   C. three pairs. D. none.
4. An atom third level is saturated with ..... electrons.
   A. two. B. eight.
   C. eighteen. D. thirty two.
5. An object potential energy is zero when the object is at the .....
   A. maximum height. B. earth's surface.
   C. when the object mass increases. D. when the object speed increases.
6. Opuntia plant stores water in its .....
   A. leaves. B. roots.
   C. stem. D. fruits.
7. The atom nucleus contains .....
   A. protons and neutrons. B. protons and electrons.
   C. neutrons and electrons. D. protons, neutrons and electrons.
8. The leaves of the aquatic submerged plants are .....
   A. neckless and small. B. necked and long.
   C. large - sized. D. necked and small.
9. Silver is symbolized by .....
   A. Hg B. Au
   C. Cu D. Ag

Question 3:

Write the scientific term that indicates each of the following sentences:

1. The ability to exert work.
2. A set of similar animals in their shape and can get intermated together to produce fertile individuals.
3. The simulation of some living organisms to the dominant natural conditions in their environment.
4. The total number of protons and neutrons inside the atom nucleus.
5. The amount of energy which an electron loses or gains to transfer from an energy level into another one.
6. The simplest pure form of a matter which can't be analyzed simpler.
7. The smallest part of matter which can be existed in a solitary form having the properties of matter.

Question 4:

Give reasons for:

1. The bike tire gets hot once you press the brakes.
2. It's favorable to produce electricity from solar energy than fuel burning.
3. The atom is electrically neutral.
4. The two forelimbs in the dolphin are different from the bat's ones although they are structured with similar bones.
5. A camel hump is considered a feature of its adaptation for survival in desert.
6. Cooking pots are made up of aluminum whereas their hand grip are made up of wood or plastic.

Question 5:

Show the difference between each of the following:

1. The element and compound.
2. Beans and wheat.

Question 6:

Your classmate has seen a bird. He doesn't know this bird's name but he has managed to describe it as a bird with a sharp beak and the legs end in fingers with strong claws.

According to your classmate story. Answer the following question.

1. What is the type of adaptation in both the beak and legs of this bird?
2. How many toes are in each leg?
3. What type of food does this bird feed on?

Question 7:

«Migration is a form of bird's adaptation»

1. Why do some kinds of birds migrate?
2. What is the type of this adaptation?
3. Give an example of a bird that travels a cross Egypt in its annual journey.

Question 8:

«Technological applications of energy transformations have benefits and harms».

Explain this sentence and give examples.

Model Answer

Answer Q1

1- Copper - aluminium
2- By increasing
3- 4 times
4- rusting and corrosion
5- Insects - Arachnids - Arthropods
6- Amoeba - Euglena - Paramaecium
7- chemical
8- work
9- Na – S

Answer Q2

1- gymnosperms
2- Mass Number
3- one pair
4- eighteen
5- earth's surface
6- ملغي
7- protons and neutrons
8- ملغي
9- Ag

Answer Q3

1- Energy
2- Species
3- Camouflage
4- Mass number
5- Quantum
6- Element
7- Molecule

Answer Q4

1- Because mechanical energy changes into heat energy by friction

2- Because Solar energy is cheaper and don't pollute the environment.

3- Because the number of negative electrons is equal to the number of positive protons.

4- Because the two forelimbs of the dolphin are modified into paddles to perform the function of swimming, while the two forelimbs of bats are modified into wings to perform the function of flying.

5- ملغي

6- Cooking pots are made of aluminum because aluminum is a good conductor of heat, while their handgrips are made of wood or plastic because they are bad conductors of heat

Answer Q5

1-

Points of comparison	Element	Compound
Definition :	It is the simplest pure form of matter which can't be analyzed chemically into simpler form by simple chemical methods.	It is a substance which is formed from the combination of atoms of two or more different elements with constant weight ratios.
Atoms :	Similar.	Different.
Examples :	Hydrogen, oxygen, aluminum and sulphur.	Water, hydrogen chloride, carbon dioxide and ammonia.

2- Beans is from dicotyledons ,while wheat is from monocotyledons.

Answer Q6

1- Structural Adaptation

2- 4 toes (3 anterior and one posterior)

3- This bird feeds on meat.

Answer Q7

1- to search for more lighted and warmer regions

2- Behavioural adaptation

3- Quail Bird

Answer Q8

Positive effects of technology:

- Using energy resources in many purposes.
- Changing energy from one form to another in some application to be used in man's life.

Negative effects of technology:

1- Environmental pollution as:
   a. Electromagnetic pollution.
   b. Noise pollution.
   c. Chemical pollution for air, water and soil.
2- There are some harms of technological applications when man uses them in:
   a. Wars and killing.
   b. Massive destruction.

Exercises 2

Question one :

Write the scientific term that indicates each of the following sentences:

1. Mass of unit volume of a substance.
2. Temperature at which liquid state starts to change into gaseous one.
3. Energy stored in an object due to work done on.
4. The simplest from of matter which can not be decomposed into a simpler one by chemical means.
5. Number of positive protons exists inside the nucleus of atom.

Question Two :

Give reasons :

1. Stem of an Elodea plant does not tear by the effect of water currents .
2. An iron nail sinks while one kilogram of cork floats.
3. Elements differ from one another in chemical activity.
4. Snakes secreting poison is considered as functional adaptation while horse hoof is as structural adaptation .
5. Technology has negative effects.
6. A camel legs has flat pad.
7. Spider is not from insects.
8. The kinetic energy of moving object increases by the increases of its mass .
9. Some birds have wide indented beaks in the two sides.

Question Three :

Choose the correct answer:

1. Negative charged particles of negligible mass.....
   a- neutrons b- protons c- electrons
2. The number of energy levels in the largest known atom is.....
   a- 9 b- 7 c- 5
3. Sum of the number of protons and number of the neutrons in the nucleus of atom is called.....
   a- mass number b- atomic number c- atomic mass
4. From animals with internal support.....
   a-Octopus b – fish c-snails
5. From myriapods arthropods.....
   a- spider b- Julius c- scorpion
6. From gymnosperms plants.....
   a- wheat b- pine plant c- maize

7. From animals with soft bodies.....
a- snails b- shrimp c- jelly fish

Question four :

Give short account for;

1. Factors affecting the potential energy.
2. Electric conduction of matter.
3. Ways of heat transfer.
4. Adaptation of insectivorous plants .

Question five :

What is meant by..... ?

1. Species.
2. Adaptation.
3. Birds migration.

Question six :

Compare between each two of the following:

1. Rodents and lagomorphs.
2. Insects and spiders.
3. Hibernation and aestivation.

Question seven :

Put (√) in front of the correct statements and (X) in front of the wrong ones :

1. Potential energy decreases by the increase of height at which the object reaches. ( )
2. Melting point is the temperature at which matter changes from a solid phase into a liquid one. ( )
3. Molecule is the smallest part in a matter that can exist freely and appears in it the matter properties. ( )
4. Animals can be classified according to the body support. ( )

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Model Answer

Answer Q1

1- Density

2- Boiling Point

3- Potential Energy

4- Element

5- Atomic Number

Answer Q2

1- ملغي

2- Because the density of iron is higher than that of water, while the density of cork is less than that of water.

3- due to the difference between them in electronic structure.

4- because secreting poison is a modification in the body internal organs and tissues while horse's hoof is a modification in the structure of body external organs.

4- because the technology causes:

- Environmental pollution as:
  - chemical pollution
  - noise pollution
  - electromagnetic pollution
- There are some harms of technology uses them in:
  - Wars and killing
  - Massive destruction

6- To help camel to walk through hot desert sand.

7- Because spider has 4 pairs of jointed legs, while insects have 3 pairs of jointed legs.

8- Because kinetic energy is directly proportional to the mass of object

9- To filter food from water.

Answer Q3

1- Electrons
2- 7
3- Mass number
4- Fish
5- Julius
6- Pine plant
7- Jelly fish

Answer Q5

1- Species: It is a group of more similar living organisms in shape that can reproduce to give birth of new fertile individuals, which are able to reproduce.

2-Adaptation: It is a modification of a living organism's behavior or its body structure, or even the biological functions of its organs to become more adapted to the environmental conditions where it lives in.

3- Birds migration: It is the inherited behavior in some species of birds, where they migrate from cold and Polar Regions lighted and warmer regions for reproduction.

Answer Q6

1	Rodents	Lagomorphs
Number of incissors	Have one pair of incissors in each jaw	Have two pairs of incissors in the upper jaw and one pair in the lower jaw
Examples	Rat, Jerboa and squirrel	Rabbit

2	Insects	Spiders
Number of jointed legs	Have three pair of jointed legs	Have four pairs of jointed legs

3	Hibernation	Aestivation
Difinition	It is the behaviour in which some animals try to dormancy and stop most vital activities to avoid low temperature in winter	Have fo It is the behaviour in which some animals try to dormancy and stop most vital activities to avoid extreme rise in temperature in summer
Examples	Reptiles and Frog	Jerboa and desert snail

Answer Q7

1- (X) increases

2- (√)

3- (√)

5- (√)

Exercises 3

Question one :

Complete the following statements:

1. Unit of volume is..... and that of mass is .....
2. An alloy of ..... is used in making jewels while an alloy of ..... is used in making heaters coils.
3. Some solutions are good conductor of heat and electricity as ..... and ..... , while some solutions which do not conduct neither heat nor electricity like.....
4. Electrons are particles with .....charges while protons are particles with ..... charges.
5. Liquid element its molecule consists of one atom is..... while that its molecule consists of two atoms is.....
6. The melting point is the temperature at which matter changes from a ..... state into a ..... one.
7. 2nd level (L) is saturated by ..... electrons while 4th level (N) is saturated by ..... electrons .
8. When a body is raised up ,the potential energy.....while the kinetic energy.....
9. The kinetic energy of a body depends on .....and.....
10. Mechanical energy = ... +.....
11. In photosynthesis process the..... energy converts into..... energy
12. In the electric heater wire the .....energy converts into ..... energy
13. Mass number is the sum of .....number and ..... number inside the nucleus of element.
14. The positive pole in simple electric cell is .....while the negative pole is..... .
15. Hawks have .....beaks while ducks have..... beaks .
16. The front limbs of whale are modified into.....
17. From plants that reproduce by spores.....and from plants that produce seeds inside cones.....
18. From teethless mammals .....and.....
19. Cockroach is considered from .....and scorpion is from.....
20. In winter, frogs hide in burrows and that is called.....while in summer jerboa hides in humid burrows and that is called.....
21. Types of adaptation are structural,..... and.....

Question two:

Write the scientific term:

1. Mass of unit volume of a substance .
2. It is the temperature at which a substance changes from a solid state into a liquid one.
3. The number of positive protons inside the nucleus of atom
4. The amount of energy gained or lost for the electron to transfer from an energy level to another.
5. The simplest pure form of a matter which can't be analyzed simpler.
6. Ability to do work or cause change .

7. One of the energy forms transfers from higher temperature to lower temperature
8. Energy stored in an object due to the work done on during motion.
9. The work done during the motion of an object .
10. The basic classification unit for living organisms.
11. A modification in behavior, structure or the biological function of a living organisms organs become more adapted with the environmental conditions where it lives.
12. The ability of some living organisms to simulate the dominant environmental conditions to be hidden from their enemies or even to capture the preys .

Question Three:

Give reasons for:

1. Wood piece floats in water while another made up of iron sinks.
2. Water does not use in putting off petroleum fire.
3. Painting metallic bridges and the holders of light bulbs in streets from time to time.
4. Cooking pots have handles made up of wood and plastic.
5. Atom is electrically natural.
6. Level (K) is saturated by electron before level (L).
7. There are air chambers in the stem of elodea plant.
8. Some plants pounce and predate insects.
9. Quail bird is a good example for adaptation to the environmental conditions.
10. Camel is called the desert ship.
11. The camel limbs ends in a flat pad and thick skin.
12. Camel eye has plenty of lachrymal glands and two rows of long lashes.
13. The thickness of camel's fur at different body region.

Question four:

What happens in each of the following cases?

1. Leaving a piece of iron exposed to moist air for a period of time.
2. When the energy of the electron is larger than the energy level in which the electron rotates.
3. Friction of the bicycle wheels to rough surface.
4. No aestivation occurs to jerboa.
5. Camel exchanges its pad with a horse 's hoof.
6. Absence of air chambers in the stem of elodea plant.
7. If the polar bear could not hibernate.
8. Increasing the body temperatwre of camel to 40°C

Question five:

Choose the correct answer:

1. From substances that float on the surface of water is.....
   a- iron b- copper c- cork
2. A piece of metal its mass is 25 gm and its volume is $10cm^3$ when it placed in water it will..... (water density $1gm/cm^3$)
   a- float b- sink c- suspended
3. The volume of liquid is calculated as this relation.....
   a- $\frac{mass}{density}$ b- $\frac{density}{mass}$ c- mass × density
4. Density of red copper is 8.8 gm/cm^3 means.....
   a-The mass of the volume unit $1cm^3$ of red copper equals 8.8gm.
   b- The mass of the volume unit $1cm^3$ of red copper not equals 8.8gm.
   c- The mass of the volume unit for $10cm^3$ of red copper equals 8.8gm
5. From inert gases .....
   a. Nitrogen b. Helium c. Oxygen
6. Balloons of festivals filled with Helium rise upwards due to the
   a. density of Helium is less than density of air
   b. density of Helium equals to density of air
   c. density of Helium is greater than density of air
7. Water molecule is consisted of.....
   a. two hydrogen atoms and one oxygen atom
   b. hydrogen atom and two oxygen atoms
   c. hydrogen atom and oxygen atom
8. The number of energy level in the heaviest atom is .....
   a. 7 b. 8 c.32
9. The matter which does not take the shape of the container is
   a. solid b. liquid c. gaseous
10. Attraction force between solid molecules is .....
    a. large b. small c. very small
11. When the atomic number for element equals to its mass number that means there is no ..... in the nucleus of that element
    a. electrons b. protons c. neutrons
12. Potential energy equals.....
    a. weight × height . b. mass × height . c. weight × speed.
13. Weight of the body on earth equals its .....
    a. mass + gravity acceleration. b. mass × gravity acceleration.
    c. mass ÷ gravity acceleration.

14. Heat transfers by radiation occurs through.....
a. only liquids b. only gases
c. material mediums and nonmaterial mediums

15. From animals which have no body support.....
a. reptiles b. snails c. jelly fish

16. Camel can live without water for .....
a. a year b. 3 days c. week or more

Question six

Identify:

1. Matter
2. Melting point
3. Boiling point
4. Atom
5. Atomic number
6. The compound
7. Law of energy conservation
8. Adaptation

Question seven:

Put (√) in front of the correct statement and (×) in front the wrong one with correcting it;

1. Density of matter = mass × volume . ( )
2. Iron rusts when exposed to dry air . ( )
3. Liquid substance has definite shape and volume. ( )
4. Molecules consist of atoms . ( )
5. Mercury is from solid metals . ( )
6. Wood and plastic are from poor conductors of heat. ( )
7. Methods of heat transferring in different media are by conduction and convection only. ( )
8. Cold air rises up, while hot air fall down . ( )
9. The bird activity during the day and the bat during night is from functional adaptation. ( )
10. Roots of desert plants extend near the surface of the soil or depths the soil. ( )
11. Human belongs to one species whatever his color or race or home. ( )

Question eight:

Mention one example for:

1. A good conductor matter for heat and electricity.
2. An inert gas.

3. A plant from ferns.
4. A submerged plant.
5. A vertebrate animal.

Question nine:

State one difference between:

1. Element and compound
2. Bean and wheat
3. insects and spiders
4. Elodea plant and Calamagrostis plant in view of : evidences for adaptation of their roots.

Question ten:

Different questions:

1. **Write down the electronic configuration of the following atoms:**

$_{11}Na$ $_{12}Mg$ $_{17}Cl$ $_{2}He$

2. **Compare between the solid, liquid and gaseous matter with regarding to :**
   - Intermolecular spaces among molecules.
   - Attraction forces between molecules.
   - Motion of molecules.
3. **" Each modification is for specific function"**

What is the function of each of the following?

- Tail fin of fish.
- Long arms of monkey.
- Wings of bat.
- Paddles of whales and dolphins.
- Front teeth of hedgehog.
- Wide indented beak of duck
- Sharp and strong claws able for bending of vulture
- Sharp crooked beak of hawk
- Dense hair inside the ear of camel
- Opening and closing camel's nostrils
- Spine needle leaves in cactus

4. Mention the formula by which you can :

a- Calculate the density

b-Calculate the number of electrons in each energy level

5. Explain an activity to show the following:

How to make a model for simple electric cell ?

6. What are the results based on the following.....?

a- Stick insect looks like the branches of plants

b- Camel's blood temperature is not constant

c- Diversity in having food for birds

d- Living of mammals in varied environment

7. Cross out the unsuitable word and then write down what expresses the rest words:

a- petroleum- wood – cork – iron.

b- lion- tiger – dog – wolf – armadillo.

c- hibernation – extinction – aestivation – camouflage.

d- bean – pea- maize – pine – wheat.

Question eleven:

Problems

1. On determining iron density using a piece of iron of mass 78 g.

   The piece is immersed in 100 cm^3 of water, the water increases up to 110 cm^3 .Calculate iron density.

2. In an experiment to determine water density, following results are recorded:

   Mass of an empty glass beaker =65 g

   Mass of the beaker containing liquid = 165 g

   Volume of the liquid measured by a graduated cylinder = 100 cm^3

   Calculate water density

3. Calculate the mechanical energy for a moving body if you know that its kinetic energy is 1000 joule and its potential energy is 500 joule.

4. Calculate:

   a- Potential energy of an object is 10 N weight ,placed at 5 m height from ground

   b- Kinetic energy of an object its mass is 2kg and moving at a speed of 5m/s

5. Calculate the weight of an object its mass is 5kg if you know that the gravity of acceleration is $9.8m/s^2$

6. Calculate the potential energy of an object its weight is 20 N, placed at 5m height from ground.

Question twelve:

a-Choose from B and C what suits from A

A	B	C
- Tiger	-An instrument used	Lives in shallow water
- Frog	-Predator bird	Has wings to fly
- Ameaba	-From arachnids	Has wide indented beak
- Microscope	-Insect	Feeds on insects
- Goose	-Bird swims in water	Has sharp strong crooked beak
- Bat	-An instrument used to examine	For distant vision
- Drosera	-Unicellular organism	Has three pairs of legs
- Stick	-Amphibian	Aestivation
- Scorpion	-Mammal animal	Example for hibernation
	-Predacious plant	Contents of drop of shallow water
	-Desert plant	Good example for hiding
	-Behavioral adaptation	Has pointed canine and molars with sharp projections
	-From mammals	Has four pairs of leg

b- Choose from B what suits from A and rewrite the complete statement:

A	B
1-Elodea plant	1-Its leaves are modified into spines
2-Opuntia plant	2-Its leaves are used to store water
3-Calamagrostis plant	3-Its leaves are ribbon like and spiraled
4-Cactus plant	4-Its leaves are sessile ribbon
	5-Its leaves are weak short

Model Answer

Answer Q1

1- gm/cm³ - gm, Kg

2- Copper and Gold - Nickel and chrome

3- acidic solution - alkaline solutions - sugary solutions and hydrogen chloride in benzene

4- negative - positive

5- Mercury - Bromine

6- solid - liquid

7 - 8 - 32

8- increases - decreases

9- mass and speed

10- Potential Energy + kinetic Energy

11- Solar - chemical

12- electric - heat

13- protons - neutrons

14- Copper - Zinc

15- sharp crooked - wide indented

16- paddles

17- Adiantum or Voughier - pine plant or cycas plant

18- Sloth - Armadillo

19- insects - Arachnids

20- Hibernation - Aestivation

21- functional - behavioral

Answer Q2

1- Density
2- Melting Point
3- Atomic Number
4- Quantum
5- Element
6- Energy
7- Heat Energy
8- Potential Energy
9- Kinetic Energy
10- Species
11- Adaptation
12- Camouflage

Answer Q3

1- Because density of wood is less than that of water , while the density of iron is higher than that of water

2- Because petroleum has less density than water so it floats on water surface and fire does not stop

3- To protect them from rusting and corrosion.

4- Because wood and plastic are bad conductors of heat

5- Because the number of negative electrons is equal to the number of positive protons.

6- Because the energy level (K) has less energy than the energy level (L).

7- ملغي

8- Because their roots can't absorb nitrogenous substances from soil that is needed to make proteins.

9- Because it migrates from cold polar areas to more lighted and warmer areas.

10- Because it can tolerate very difficult environmental conditions of the desert for a long time.

11-to help it to walk through hot desert sand.

12- ملغي

13- ملغي

Answer Q4

1- It will rust

2- The electron will transfer to a higher energy level and the atom become in excited state.

3- The mechanical energy will change into heat energy

4- It will die because it will not tolerate high temperature and shortage of water in summer.

5- Camels can not walk through hot desert sand

6- ملغي

7- It will die because it can't tolerate cold temperature in winter.

8- ملغي

Answer Q5

1- Cork 2- sink

3- mass/density

4- The mass of the volume unit 1 cm3 of red copper is equal 8.8.

5- Helium

6- Density of helium is less than density of air.

7- Two hydrogen atoms and one oxygen atom

8- 7 9- solid 10- large 11- neutrons

12- Weight x height 13- mass x gravity acceleration

14- Material mediums and non-material mediums.

15- Jelly fish 16- ملغي

Answer Q6

1- Matter: It is everything around us on the Earth's surface.

2- Melting point: It is the temperature at which matter begins to change from solid state to liquid state.

3- Boiling point: It is the temperature at which matter begins to change from liquid state to gaseous state.

4- Atom: It is the smallest individual unit of matter, which can share in chemical reaction.

6- Atomic number: It is the number of protons in the nucleus of the atom.

7- The compound: It is a substance, which is formed from the combination of atoms of two or more different elements with constant weight ratios

8- The conservation law of energy: Energy is neither created nor destroyed, but it is converted from one form to another.

9- Adaptation: It is a modification of a living organism's behaviour or its body structure, or even the biological functions of its organs to become more adapted to the environmental conditions where it lives in.

Answer Q7

1- (X) mass/volume
2- (X) humid air
3- (X) indefinite shape and definite volume
4- (√)
5- (X) liquid metal
6- (√)
7- (√)
8- (X) hot air rises up, while cold air falls down
9- (X) behavioral adaptation
10- ملغي
11- (√)

Answer Q8

1- Copper
2- Helium
3- Adiantum - Voughier
4- ملغي
5- Cow - horse - fish

Answer Q9

1	Element	Compound
Difinition	It is the simplest pure form of matter which can't be analysed into simpler form	It is a substance, which is formed from the combination of atoms of two or more different elements with constant weight ratios
Atoms	Similar	Different
Examples	Hydrogen, Oxygen, Auminiun	Water, Hydrogen Chloride, Carbon dioxide

Beans	Wheat
Dicotyledon	Monocotyledon

3	Insects	Spiders
Number of jointed legs	Have three pair of jointed legs	Have four pairs of jointed legs

Answer Q10

1-

	K	L	M
$_{11}Na$	2	8	1
$_{12}Mg$	2	8	2
$_{17}Cl$	2	8	7
$_{2}He$	2	-	-

2-

Points of comparison	Solid	Liquid	Gaseous
1. Motion of molecules :	limited motion (oscillatory motion)	more free (intermediate)	completely free (unlimited)
2. Intermolecular spaces :	very small (narrow)	relatively large (intermediate)	very large
3. Intermolecular forces :	very strong	relatively weak (intermediate)	very weak (vanishing) or almost not existed
4. Volume :	definite (fixed)	definite	indefinite (variable)
5. Shape :	definite	indefinite	indefinite
6. Examples :	• iron • aluminum • copper	• water • alcohol • oil	• carbon dioxide • oxygen • water vapour

3- مـلـغـي

Climbing

Flying

Swimming

Capturing insects

Filtering food from water

To control pouncing the prey

To tears prey's flesh

مـلـغـي

مـلـغـي

مـلـغـي

4- a- Density = mass/ volume

b- $2n^2$

6-

a- it can hide from its enemies by making camouflage

b- مـلـغـي

c- Structural adaptations in the beaks and legs of some birds

d- Structural adaptations in the forelimbs in some mammals.

7- a- iron --> others float on water surface

b- Armadillo --> others have pointed canines and strong molars

c- Extinction --> others are adaptations with environmental conditions

d- Pine --> others are angiosperms

Answer Q11

1- Volume of piece of iron= v2- v1 = 110 - 100 = 10 cm^3

Density = mass/ volume = 78/10 = 7.8 gm/cm^3

2- Mass of liquid = m2 - m1 = 165 - 65 = 100 gm

Density = mass/volume = 100/100 = 1 gm/cm^3

3- Mechanical energy = Potential energy + Kinetic energy = 500 + 1000 = 1500 Joule

4- a- Potential Energy = Weight x height = 10 x 5 = 50 Joules.

b- Kinetic energy = 1/2 x mass x $speed^2$ = 1/2 x 2 x 5^2 = 25 Joules

5- Weight = mass x gravity acceleration = 5 x 9.8 = 49 Newton

6- Potential energy = Weight x Height = 20 x 5 = 100 joules

Answer Q12

A	B	C
- Tiger	-An instrument used	Lives in shallow water
- Frog	-Predator bird	Has wings to fly
- Ameaba	-From arachnids	Has wide indented beak
- Microscope	-Insect	Feeds on insects
- Goose	-Bird swims in water	Has sharp strong crooked beak
- Bat	-An instrument used to examine	For distant vision
- Drosera	-Unicellular organism	Has three pairs of legs
- Stick	-Amphibian	Aestivation
- Scorpion	-Mammal animal	Example for hibernation
	-Predacious plant	Contents of drop of shallow water
	-Desert plant	Good example for hiding
	-Behavioral adaptation	Has pointed canine and molars with sharp propections
	-From mammals	Has four pairs of leg

b- ملغي